

Southern California

The Land and Its People

*A Reader
for Beginners in Geography*



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The new City Hall in the center of Los Angeles as it looks from high in the air.

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Southern California

The Land and Its People

*A Reader
for Beginners in Geography*

BY
HAROLD W. FAIRBANKS, PH. D.



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PREFACE

THE FOLLOWING TEXT has been prepared especially for use in the schools of Southern California.

Of books that picture the home life and environment of children of other lands there is almost no end. But up to the present there have been almost no books published from which our children could get an orderly and usable notion of the factors which have made the very interesting land in which they live and which would, at the same time, serve as an aid in bridging the gap between what is nature study in the narrow sense and the beginnings of real geography.

The children of Southern California enjoy exceptional advantages. Good roads and the almost universal use of the automobile have contributed greatly to their first-hand knowledge of those areas which are outside the immediate home environment but which, nevertheless, are tributary to it. Besides this, many of them have come from other parts of the country where life conditions are different. Last of all there is open here to their observation a wonderful variety of those physical factors which, when understood, can be later used to illustrate life over the whole world. We should make use of these advantages to the utmost.

Our home environment seldom receives the attention it should in the lower grades. Perhaps this is because the home life and customs of other lands are more colorful than ours. Perhaps this emphasis upon life in other lands may be a survival of the time when the common things about us were considered of little educational value. The home is so familiar that we often fail to realize its tremendous educational value, especially as a foundation for the worth-while study of geography.

An earnest effort has been made to confine the vocabulary, as far as possible, to the simplest and most familiar words that will express the ideas that it is intended to convey. It is hoped that the text is elementary enough to be put into the hands of the children of the upper third grade and the fourth grade.

It is apparent from an examination of the courses of study of the leading centers of population in Southern California that there is little uniformity among them as far as nature study and beginning geography are concerned. In the third and fourth grades of some school systems geography is begun, as it should be, by a study of the region about the home. In others geographical ideas are first introduced through stories of life in other lands. This is followed by some home geography. In still others there is no home geography, strictly speaking.

Nearly all the schools have work in nature study in the third and fourth grades. This work should,

if properly organized, pave the way for the introduction of geographical ideas. By this is meant the ideas of relationship between the facts and phenomena of the environment. But as a rule it does not do so.

As valuable as the writer believes nature study to be for its own sake, if it is to accomplish what it should, it must not stop with the study of its materials as so many interesting but isolated facts. On the contrary, it should lead, through the idea of the relationship between these facts, into the study of geography. The attempt to get at the *why* of the facts under consideration not only develops the reasoning powers, but also lays the foundation for geographical thinking.

How much more significant, even for very small children, become the materials commonly included in a course in nature study when these are examined and discussed in the light of the causes which have made them what they are, that is, in the light of their environing conditions. Children who have not had their natural inquisitiveness deadened want to know the *why* as well as the *how* of things.

Getting at the relationships among the materials commonly introduced into a nature study course is *geographical nature study*. This is the transition from the mere observation of facts to their interpretation.

Real geography goes a step farther than nature study. It deals not only with facts open to obser-

vation in the home region, but with similar facts and relations in the world outside the observation and experience of the pupils.

The author's experience has led him to conclude that at least three-fourths of the children of the third and fourth grades know something personally of the mountains, the beaches, the productions, and industries of the chief valleys of our homeland. The material of the book has been chosen with this in mind. The city of Los Angeles, the heart of this region, has been made the motivating center of interest. This plan affords a nucleus or point of departure for the discussion of the various topics taken up.

While Los Angeles has within its boundaries by far the larger part of the children of Southern California, it did not seem best to introduce a great deal of local material. The city covers so much territory of such a diverse nature that schools in different parts differ, as regards their environment, almost as much as other centers of population. Under such conditions it would be impossible to discuss the mass of local details of life conditions in such an important city as Los Angeles. Since the book is intended for use over the whole of Southern California, local details, no matter how important they are, would be out of place.

Each school has its own individual environment. A part of the work given the children in any district should deal with local conditions. Another

part should take up those facts and relations that are more or less common to Southern California as a whole. It is the especial purpose of this book to deal with the latter class of material.

The author has said nothing about maps. In his opinion the study of maps, particularly maps of distant lands, is commonly introduced into our schools at too early a period. Besides this it is not preceded, if one can judge from the printed courses of study, by the necessary training in interpretation of the map of the home region. With the object of keeping the presentation as simple as possible, the direct development of the idea of the meaning of maps, even of the home region, is not undertaken, although such a study is a legitimate one in the latter half of the fourth year.

The author has emphasized the sand table because of two reasons. One is that there are no relief maps of Southern California with sufficient detail to be of any value to pupils who will use this book. The other reason has already been given. The map is a mass of symbols which it takes imagination to understand. The relief map or sand table is the legitimate introduction to the use of maps. It depicts in a rough way the real surface with which the pupils are more or less familiar. Before we can expect children to imagine conditions which they have not seen, we must establish an understanding of similar conditions in their environment and give them something real on which to build mental pictures.

It is believed that the use of the sand table will lead unconsciously to a felt need for a map. This alone would justify its intensive use. Even the sand table has its limitations. It is the author's experience with children at the sand table that most of those below the high third grade are incapable of picturing in their minds what the features of the sand table stand for, even though these features are exemplified in the surface of the country within sight of the schoolhouse.

In the exercises as much practical work on the part of the pupils as possible has been introduced. The teacher should make use of local conditions so as to add greatly to this. It is generally accepted that children as well as adults acquire usable knowledge only by seeing and doing.

The geography of the home region is important in itself from a practical point of view. Simple discussions and exercises should be introduced as early as possible in the school course. Home geography is also a prerequisite to the real understanding of the geography of distant lands. If geography is going to maintain its place in the schools it must cease making facts the aim, but use them as means to the aim—an understanding of their significance for human life.

These are the reasons why, aside from informal stories and descriptions of the life of the interesting peoples of other lands, the geography of the third and fourth grades should be built on and grow

out of nature study. The latter when rightly planned forms the best foundation for a real, vital geography.

In the present book the author has interpreted the "home" as meaning Southern California as that name is usually applied. The different regions of this field have much in common. Even those parts with which the children of individual districts are not personally familiar can be made more or less real to them if the relationship in the parts they do know are properly developed.

The author wishes to thank the following organizations for the use of photographs: Los Angeles Chamber of Commerce, Los Angeles Board of Harbor Commissioners, San Diego Chamber of Commerce, Santa Barbara Chamber of Commerce, Banning Chamber of Commerce, Orange County Publicity Department, Big Pines Recreation Camp, Palos Verdes Estates, El Centro Chamber of Commerce, and the Los Angeles *Times*. The most of the pictures were taken by the author.

H. W. FAIRBANKS,
Glendale, California.

GENERAL SUGGESTIONS

THE TEXT is intended to be placed in the hands of the pupils both as a reader and as a basis for socialized discussions.

The extent of experience and the degree of development vary in every class and in every locality. Consequently a book which depends for its success upon the establishment by this class of an intelligent contact with the leading factors that make their Southern California home what it is, cannot be used in a routine way.

Since the environment of each school differs from that of every other, the teacher should vary the topics as well as the emphasis to suit the needs of the pupils of her particular locality. Only those topics should be introduced which they are able to visualize either through their own experience or by the aid of pictures and descriptions.

A large part of the material can be made real for the children of Los Angeles and tributary valleys. In the outlying districts it will be necessary for the teachers to make especial effort to bring it within the comprehension of third and fourth-year pupils. Almost everywhere, however, it will be found that the immediate environment is surprisingly rich in illustrative material.

At every step the experiences of those pupils who have traveled most widely should be used in socialized discussions for the benefit of those who have traveled less.

Children are far more observing than they are usually given credit for. These observations are unorganized; even they, themselves, are not consciously aware of them until they are drawn out through skillful questioning by the teacher.

Inasmuch as the relief is the dominating factor in the climate, and, through the climate, in the character and distribution of the productions and many of the industries of Southern California, the topics offered cannot be understood without a graphic representation of the chief features, and we must have something to show this. The use of maps at this stage is obviously out of the question. Good relief models showing the necessary details are not to be had. Consequently it is necessary for us to fall back upon the sand table. Although this has serious disadvantages, its advantages far outweigh them. Every school should be supplied with one large enough to show the major features of the whole of the region we are studying.

The sand table is better for little children than a fixed model. It gives them an opportunity to express with their own hands what they see in the landscape. The local details can be shown upon it, while no model can be purchased that will give more than a generalized idea of our region as a whole.

The model of Southern California as a whole should show reasonable accuracy. Of course only the major feature can be shown upon this. In the relief of the local region, which can be made upon a much larger scale, all the detail needed can be shown.

In the discussions about the winds, the rains, and the temperature, and how these govern the distribution of population and occupations, the children should have the model before them.

There are plastic materials with which all elementary teachers are familiar which should be employed for the small individual work of each child.

The teacher should not rest satisfied until every pupil is able to understand and visualize the ways in which we are dependent upon Nature.

SUGGESTIONS AS TO THE USE OF THE RELIEF MAP

THE MAP opposite page 1 covers more of the state than is usually designated Southern California. In the text, Southern California is spoken of as that part lying south of an easterly and westerly line through Tehachapi. This pass is distinguished by the deeply shaded depression connecting the Mohave Desert with the San Joaquin Valley.

The main purpose in inserting the relief map is to enable the teachers to make a reasonably accurate sand table model.

In the author's opinion pupils should not be introduced to maps below the high fourth grade. Through the relief model of the home district they are led to see the necessity for maps and to understand the significance of the symbols by means of which the natural and cultural features of an uneven surface are represented on paper.

This relief map is the best that has yet been made of Southern California. But like all black and white relief maps it fails to indicate some important facts. The shading does not tell why the climate and productions of the southern slope of the Mohave Desert, known as Antelope Valley, are so different from those of Imperial Valley.

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Relief Model of
SOUTHERN CALIFORNIA
Prepared Under the Auspices of
the California Development Board
See suggestions for use of this
map on page XVI

Southern California

Its Land and Its People

CHAPTER I

TO THE CHILDREN OF SOUTHERN CALIFORNIA :

In this little book you are going to learn about your homeland. You are going to find out what kind of a place Mother Nature has given you. She has given you a wonderful home, but perhaps you do not know how wonderful it really is.

You are going to learn how Mother Nature made this homeland. You are going to learn why she made it as she did, and what she put into it.

You are going to hear the story of what your fathers are doing. You are going to learn the use they are making of what Nature has given your home. This story is almost like a fairy tale, only that it is a true story.

I am sure you already know something about your homeland. You know that it is very fertile. You know how the soil, the water, and the sunshine cause many kinds of good things to grow.

But you should know more about this land. You should know how to take good care of it, that it may always be as beautiful and pleasant as it is now.

The great ocean lies on one side of your homeland. On the other side there are mountains and deserts. Between the mountains and the ocean there are beautiful slopes and valleys. In these valleys the summers are never very hot. The winters are never very cold. There are always fresh fruits and flowers. There are few bad winds. There are no floods, as in some lands, to wash your homes away.

You must thank Mother Nature for making such a happy land. She made the mountains that supply water. She spread the fertile soil over the valleys. She put the rivers where they are. She makes the bright sunshine. She makes the soft breezes blow. She brings the warm rains. She made the ocean highway. On this highway you can go to the homes of the children of whom you have read. She made the bays where the ships may anchor in safety.

Mother Nature spread the carpet of wild flowers. She grew the willows and sycamores along the streams. She grew the oaks on the moist slopes. She picked out bushy plants for the dry slopes. She found the mountains a good place for pine trees. She chose plants with small leaves for the deserts. Then she filled the waters with fish, the land with animals, and the air with birds.

But this was not all. Perhaps Nature knew that men were coming to make their homes here. There must be something for men to eat and use. The fish, animals, and birds would supply a part of this food. The seeds of the wild oats and other grasses made



Here is a little mountain stream that is fed by springs. Farther down the slope it joins others to make the river. Would you think it summer or winter? Find the big rocks. They have rolled down from the slope above and are ready to go a little farther if a flood should come.

good food. The acorns on the oak trees, the sweet roots in the ground, and the pine nuts of the mountains would supply another part. Gold was hidden in the rocks. Petroleum was placed so deeply in the ground it was a long time before men found it.

Nature did only those things men could not do for themselves. She left the care of the tame animals and cultivated plants to them. She does not plant your gardens. She does not set out your orchards. She does not dig the ditches that carry the water for their needs. She does not make your roads. She does not make you any shelters from the wet and cold.

Your land now has pleasant homes. It has good roads. It has gardens and orchards. It has factories. It has many oil wells. It has great cities. Ships and trains of cars come and go. For all these things you must thank your fathers and mothers. They have taken up the work of Nature. They are working hand in hand with her. They are making use of the things Nature put here. They have now also many plants here that Nature had put in other places.

The Indians were the first people to find this beautiful land. They came a long time ago. They brought nothing with them. They ate just what Nature gave them. They made their shelters or homes of what they found at hand. They needed little clothing. They were happy, for they had all they wanted.



This is an Indian dressed very much as our Indians used to dress. You can see the feathers in his cap, the beads around his neck, and about his hips the skin of some animal. In his left hand is a spear with a flint point.

This homeland of yours has the three things you need most. It has fertile soil, water, and warm sunshine. It has also many other things. But our Indians did not know how to use any of them. They did not cultivate plants for food. They did not tame any of the animals or birds. They did not find the minerals hidden in the earth.

The first Indians came across the wide ocean. Their home was in the land on the other side. Their land lay toward the sunset or west. They found this new land a pleasant place. There was water and food. The air was mild. And so they stopped here.

Our fathers came from the land toward the sunrise. We call this land the East. Their forefathers came from a land beyond another ocean. They brought with them, from this far land, grains and seeds of fruits and vegetables. They brought animals to help do their work. They brought other animals to supply part of their food and clothing. Very long ago all these plants and animals lived in a wild state.

Wild plants are Nature's plants. Our forefathers of long ago found them growing in her garden. But she gave them no care. Our forefathers picked out the best of these plants. They set them out in better soil and gave them water when it was needed. They kept the soil soft around them. Because of this kind treatment the heads of wheat became larger. The roots grew larger and more tender. The trees bore bigger nuts and sweeter fruits. New kinds of berries

grew on their vines. From Nature's wild flower garden came the beautiful flowers of your home garden.

The young of wild birds and animals were caught and tamed. In this way our forefathers got for their



You will find very pretty homes all over Southern California. Many of them are like homes in Spain and Italy, being built around an open place in the center called a "patio." The picture shows a patio. Describe all the different things you can see in it.

use chickens, ducks, sheep, goats, cows, donkeys, horses and dogs. These now grow up tame because their mothers are tame. The most of them would not leave us if they could.

The tame animals and cultivated plants helped our forefathers to have better food, better clothing, and better homes. Now we could not get along without these comforts.

Many wild or savage peoples have some tame animals. But the Indians of our Southern California home lived without any of them. Our Indians had few wants. They did not have to work. They made



Taking a moving picture in Hollywood.

their trails where it was the easiest going. If the spring that supplied them with water dried up, they moved their village to another one.

Our fathers wanted many things. They got these by working hard. They rolled away the rocks and made the roads smooth and straight. They searched for living springs or streams. They brought water from these in ditches to the places they chose for homes. Where this was not easy to do, they dug wells which gave them the water they needed.

Our fathers found this land to their liking. The seeds and plants they brought also liked it. How they grew and thrived! Go where you will in our land, you will now find gardens and orchards without end. We have railroads and smooth automobile roads. We have built ships and aëroplanes to aid us in our work.

We have beautiful homes. We grow more kinds of fruit and vegetables than are grown in any other part of the world. We have schools, churches, theaters, and newspapers. We have factories where many things are made. Goods from all parts of the world are in our stores.

This is a picture of our Southern California home. What do you think of it? Do you know of any better place? If you do, tell us about it.

THINGS TO TALK ABOUT AND DO

What land, that you have read about in your storybooks, do you like best?

Tell about the dress, the homes, and the food of the children of this land. Would you like to live in this land?

Tell why you are glad that you live in Southern California.

Can you think of anything that would be nice to have that Nature left out when she made our land?

If you were Nature, would you have made our land any different from what it is?

What do you mean when you talk about wild or savage people?

Why do the Indians like their own homes better than they do ours?

Find out why our Indians are sometimes called "Diggers."

Why are the Indians now all gone from the most of our land? In what parts are there a few left?

Are there any wild animals here that the Indians could have tamed and made to work for them?

Do you know of any wild fruits, berries, vegetables, or nuts that the Indians might have cultivated?

What is meant by "living springs and streams"?

Why is it better to bring water in pipes than in ditches? Of what are pipes made?

Why do our gardeners save the best seed for planting?

NEW OR UNUSUAL WORDS

comfortable	delight	pleasure	treasure	shelter
cultivate	anchor	factory	thrive	

CHAPTER II

AN INDIAN VILLAGE OF LONG AGO

LONG AGO there were only Indians in Southern California. Each valley had its own tribe. Each tribe had its own language. The tribes that lived side by side could understand one another. If there were mountains between them their languages were quite unlike.

These Indians lived in villages. They were thus more safe from attack than if each family lived by itself. The villages were placed close by living springs or streams. In such places there was always water. They thought of water first, just as we do. If there was plenty of game or fish, acorns and wild grasses near by, the village was large. If there was little food the village was small.

We can tell where the villages were by the things we find in the earth. Men often plow or dig up arrow points, stone knives, beads, charcoal, and pieces of bones and shells. Sometimes we find mortars and pestles. A mortar is a stone that has been hollowed out. A pestle is a long slender stone that was used to crush acorns and grain in the hollow of the mortar.

Let us picture in our minds one of these Indian villages. This village was called Yang-na. Here lived about three hundred Indians. The village was in a valley between hills. From the highest hill the In-

dians could see the ocean. If they turned around and looked another way they could see high, steep mountains.

At one side of the village a stream of clear water flowed over its sandy bed. Willows and tall grass grew along its banks. Back a little from the water were sycamore trees. Some of these were very large. Here and there in the valley grew live-oak trees. Bushes of many kinds covered the hills.

The huts or homes of the Indians were very simple. It was little work to make one of these huts.



An Indian woman weaving a basket for her granary. Could she get any acorns in the desert to put in her granary? Tell what you can about her home from the picture.

There was first a frame of light willow poles. These were stuck in the ground and then bent over and tied together in the middle. Grass or small willow branches were woven between the poles. Some of the huts were plastered with mud. Others were covered with skins. The skins kept out the rain and made the huts warmer in winter.

In summer the Indians went naked. In winter each wore a sort of blanket of skins or of matting. Most of the blankets were made of rabbit skins sewed together. Sometimes the skins of the coyote or antelope were used. There were bears among the willows. But it was not often that they got the skins of these great animals. Bows and arrows and spears were the best weapons these Indians had.

What do you think the Indians ate? What would you find to eat if you were lost where no one lived? Think how it would be in our land without orchards and gardens. Think how it would be without the fruit stands and stores with all sorts of good things.

Nature gave the Indians many kinds of food. She supplied them just as she supplies the wild creatures. You would think you were having a very bad time if you had to eat some of these foods. But the Indians enjoyed them all very much.

First there were the roots of the flag that grew in marshy places. These were roasted in the hot ashes. Then there were flower bulbs of different kinds that they dug out of the ground.

Wild barley and oats grew in places where the

soil was rich. Their seeds were gathered in the early summer. There were wild grapes along the streams. In the fall they gathered acorns from the oak trees. Wild walnut trees gave them small but good-tasting nuts. From the high mountains they got pine nuts. Horse chestnuts grew on the mountains near the coast.

The grains, nuts, and acorns were stored in granaries. These were huge, roughly woven baskets. They were placed on poles to keep them away from the squirrels and mice.

Have you ever tasted an acorn? Why do we not eat acorns? The acorns were ground to flour in a mortar. Hot water was poured through the flour to take away the bitter taste. The flour was then made into paste and baked.

The Indians were very fond of soup. In it they put many things, just as we do. The soup was made in hand-woven baskets. The baskets were made water tight by plastering them on the inside with acorn flour paste.

Then they put in flour made of grains or acorns and mixed it with water. Then they put in such tit-bits as grasshoppers, grubs, and frogs. To this were added birds and any chunks of meat of larger game that they happened to have.

But this was raw soup. I am sure that even the Indians would not like it. How do you suppose they made it tasty? This was done by dropping very hot rocks into the baskets. This made the water boil

and soon everything was well cooked. Can you tell why they did not put the baskets over a fire?

There are now few wild animals to be seen in our land. But when the Indians lived here the animals and game birds were everywhere. There were geese, ducks, and quail. Besides these the Indians ate many small birds that we now protect. Among the animals there were ground squirrels, cotton-tail rabbits, jack rabbits, coyote, antelope, deer, California lion, and bear. In some of the large valleys there were elk. In the very high mountains there were mountain sheep. A few of these sheep are left. When you climb Mount Baldy you may see some of



These desert Indians seem to have a pretty snug home. Can you tell of what it is made? Is the building in the back part of the left side of the picture an Indian building or a white man's building? Of what do you think it must be made? There are no trees or rocks here, but there must be water and willows.

them. Now our game law protects them from the hunter.

At times the Indians of Yang-na traded with the Indians that lived on the coast. They got from them clams, mussels, and fish. They gave acorns or grain in exchange.

When there was plenty to eat the Indians feasted. When food was scarce they went hungry. Can you tell why it is that we always have plenty?

The women gathered the roots, seeds, and acorns. They carried these home in baskets hung on their backs. The children helped their mothers part of the time. The rest of the time they played or slept.

Sometimes the men also played games. One would roll a small ring along the ground. Another would try to throw a long light wand or stick through the ring. In another game they knocked a ball about with a stick. The stick had a knot at the end of it. This game was much like golf.

All the villages in one valley belonged to the same tribe of Indians. In others valleys there were other tribes. They were peaceful and there was little fighting among them.

The Indians of Yang-na were like most of the other Indians in California. But in the desert valleys, away beyond the mountains toward the sunrise, there lived tribes who were different. These Indians cultivated the ground. They grew corn, squash, beans, and other vegetables. They wove beautiful baskets. They made dishes out of clay and then

baked them in a fire. We call such dishes as those pottery.

Yang-na was a good place for an Indian village. Think of all the reasons you can why this was a good place. We have just been talking about these reasons.

The Indians of Yang-na had plenty to eat most of the time. They lived happily there for many years.

One day a strange thing happened. A party of white men on horses rode down to the river that



This is a little Indian wick-i-up. It is not large enough to live in, but shows you how their homes were made. It is probably a sweat house, for there are some stones inside. The Indians covered it well with skins or bark, made the stones very hot, then a sick Indian went inside, poured water on the hot stones, and had a good sweat.

flowed by the village. They crossed the river and made their camp on the smooth flat near the village. The leader of the party was Don Gaspar de Portola (Dōn Gāspār de Pōr tō lă'). The other was Father Junipero Serra (Hōō nē' pā rō Sěrrä).

The Indians were friendly and gave the white men water and food. Portola thought the Indian village such a fine place for a city that he gave the place a name. This was a very long name. You will learn more about it by and by. In the morning the party went on its way.



The granary of a family of Indians living near a spring in the Colorado desert. What do you suppose the Indians put in the granary? Why do they place it on poles? At the left is a mesquite tree. Find out what use the mesquite is to the desert Indians. Perhaps it bears something that could be stored in the granary.

Twelve years after this something else happened to the Indian village. White people came again. This time they came to stay. This was the end of the quiet village where the Indians had lived for so long.

This was the end of the quiet, happy Indian days. The Indians made little use of the beautiful country Nature gave them. Finally other people came who could use it.

The Indians were quite unlike the white men. They wanted to live their own way. They were unhappy when made to work. They were unhappy when made to live as white men live. In a few years they were all gone.

SUGGESTIONS TO THE TEACHER

Using the sand table, make a long and rather narrow valley between hills. Make a river winding down the valley. Place the valley so it will extend in a north and south direction. This can be done by taking the sun at noon as a guide. Make the river flow toward the sun or south.

Model a large, flat, basinlike valley out of which the river flows. Place this to the northwest of the narrow valley. Model a plain on which the river enters after leaving the narrow valley.

Place the Indian village on the right-hand side of the stream as you look down the valley, and just at the point where the narrow valley begins to widen to join the plain.

Indicate the village by something to represent shelters. Place here and there in the valley oak and sycamore trees and willows along the stream.

Mortars and pestles can be made of modeling clay. Baskets for various purposes can be made of paper or other material. The carrying baskets should be wide at the top and pointed at the bottom. A cord across the forehead held them in place on the back.

THINGS TO DO AND TALK ABOUT

Have you seen wild oats growing? Do they look very different from cultivated oats? Sometimes the Indians found a few wild raspberries and wild grapes. Where do you think they grew?

Did you ever hear of the chinquapin nut? These come from a little bur, like a chestnut bur, that grows on a bush on the high mountain slopes. The chipmunks feast upon them in the late summer and fall.

Pine nuts are much used by Indians. The piñon pine bears the best, although good ones come from the sugar pine and the digger pine. Can you find out where each of these pines grows? Each one likes a different place.

Children from the East may tell what wild berries they find there in summer. Also what nuts Eastern children gather in the fall.

Why do we call the oak that grows in our valleys "live oak"? How can you tell a sycamore tree when you see it?

Have you seen the *flag* growing? You remember the Indians ate its root.

What is *charcoal*, *matting*, and *frame*?

NEW OR UNUSUAL WORDS

weapon	protect	happen	titbit	feast	paste
	plaster	different	cultivate		

CHAPTER III

WHERE WAS THE VILLAGE OF YANG-NA?

YANG-NA was not a make-believe village. Once there really was such a place. We know that it was in the land about which we are going to learn. We know that it was in Southern California. But just where was it? Perhaps you have already guessed. Perhaps you are right. I am not going to tell you now.

We will first look at the country around the village. Then we shall know much more about it. We have learned that Yang-na was in a valley between hills. A stream, we might call it a river, flowed down the valley.

If you stood by the river and faced the way it flowed you would be looking toward the hot lands or south. You would have the sun shining squarely in your face at noon.

Your right hand would be toward the sunset or west. Your left hand would be toward the sunrise or east. Your back would be toward the north star or north. Ask someone to tell you how to find the north star by the pointers in the Great Dipper.

Yang-na was on the side of the valley toward the sunset or west. Let us climb the hills that lie on that side of the village. We can reach the highest of them by going toward the northwest. By this is meant a course or direction between north and west.

Up and down over the grassy hills let us go. In the spring there are wild oats on them. In the hollows there are bushes and live-oak trees. It is a long walk, but by and by the hills turn to mountains. The mountains are steep and covered with bushes.

At last we have reached the top of the mountains. We are now on a long sharp ridge. This ridge extends far away toward the sunset or west. It must end in the ocean. Toward the sunrise or east lies the long narrow valley. You will remember that the village from which we started lies at the lower end of this valley.

On either side of the mountain ridge are great valleys. These valleys are so flat and so far across we might call them *plains*. Perhaps it will help you if I tell you that the lowland to the south of the mountain ridge is now called a plain. The one toward the north is called a valley.

With the aid of field glasses we can see the huts in the village of Yang-na. Just below the village, toward the south, the narrow valley widens out. It becomes the great plain of which we have spoken. This plain extends far away to the ocean. The plain is wet and marshy in places. We can tell this by the willows and tules. The river, after flowing by Yang-na, started for the ocean. But it seems to get lost on the plain. We can no longer see it.

We can see the ocean shore for a long way. The most of it is quite low and sandy. We can see the glitter of the sun on the waves as they break.

In the middle of the long shore line rise high hills. They extend out into the ocean. The waves dash against their rock cliffs.

On each side of this rocky point or headland is a bay. The shore curves in very gently to make these bays. They are wide open toward the ocean. Ships would not be safe in them in time of storm.

I am sure some of you know the name of the hills that make this headland. We shall learn more about



An Indian bowl made of soapstone. This stone is very soft and has a greasy or soapy feeling, and is easily cut. The stone from which it is made is found on Catalina Island. Note how nicely it is made and the pretty pattern cut in the stone.

it by and by. To the left of the hills our glasses show us a little inlet. An *inlet* is a long narrow bay. When there is much water in the river it must flow into this inlet.

Ships would be safe from storms in this inlet, but the water must be shallow. It would be a good harbor for Indian canoes and for fishing boats.

The little inlet or bay is south of the mountain we are on. If we turn squarely around we shall be looking north. Far below us is the great round valley that we made on the sand table.

All about this valley, except in one place, there are mountains. The valley looks like a huge basin. From this valley comes the river that flows by Yang-na.

Turning our heads toward the east or sunrise we see the narrow valley of Yang-na. We see the river flowing out of the great round valley and down past the village.

But this is not all there is to be seen from our mountain top. The field glasses show us many other things. Toward the east or sunrise there are other valleys. There are more than we can count. Hills and low mountains keep the valleys apart. Low places between the hills lead from one valley to another.

Beyond all the valleys, and very far away, there are high mountains. These mountains form a rim around all the land that we can see. This land has mountains on the side toward the sunrise. The broad ocean lies on the side toward the sunset.

The two highest peaks of this mountain rim are in front of us as we look toward the sunrise. They seem to be twins. Their tops are white with snow. Between the twin peaks there is a low place. We might call it a gap or *mountain pass*. It looks like a good place for the Indians to cross the mountain rim. By and by we shall go through this pass. A part of the land we are going to learn about lies on the other side of the mountains.

To the left of the twin peaks is another high mountain peak. It is not so far away as the others. Its top is rounded and has snow on it. In the summer when the snow has melted it looks bald. This is because it rises so high that trees will not grow near



This picture shows the members of a tribe of Indians living in the mountains north of San Diego. They hardly look like Indians, nor are their homes like those they made when white people first came. Tell from the picture of what this home is made.

—Photo by Lummis.

the top. I am sure you will have seen this mountain and know what it is called.

Still nearer on our left are other mountains. They are high and steep, but have no snow on them. Our glasses tell us that they have tall pine trees on their tops.

Two rivers flow through the valleys between us and the far twin peaks. We cannot see them very clearly. They seem to get lost in marshes and sandy places before reaching the ocean. They cross the same stretch of level land or plain that the river of Yang-na does.

We can now understand in what a good place the Indians built the village of Yang-na. Do you wonder that the first white men thought it a good place for a city? There are many kinds of country near it. There are mountains, valleys, plains, and the ocean not far away. Trails lead off in every direction. Nature supplies wild animals, birds, fish, seeds, nuts, and roots. There are many kinds of food because there are many kinds of slopes. Some are cold, others are warm. Some are wet, others are dry. Some have good soil and some have poor soil.

There are many other villages in the valleys below us. But none of these is in so good a place as Yang-na.

The sun is going down. Cool fog is coming from the ocean. It drifts over the lowlands. It hides the valleys and the Indian villages. Soon only the tops of the mountains rise above the fog.

We look down on this fog. It seems like a great ocean. On its top are waves like the waves on the real ocean. The mountain tops look like islands.

The air is still nice and warm upon our mountain top. In the valleys under the fog the air has become cold. Shall we stay all night in this pleasant place and see the sun rise in the morning?

SUGGESTIONS TO THE TEACHER

Model on a large scale in the sand the chief features of the region immediately around Los Angeles. Use as a guide the relief map issued by the Pacific Electric Company. This is the best detailed map available.

This map should not be shown to the children nor anything said about a map. The object should be to get them to understand that the features of the sand table form a small picture of the real country as it would appear if they were high in the air in an *aéroplane*.

The Santa Monica Range should be shown, also the Verdugo Mountains and the Sierra Madre or San Gabriel Range. Model the San Pedro or Palos Verdes Hills extending out into the ocean and the long stretches of beach to the northwest and southeast.

Be particular to show as well as is possible with the sand the valleys leading away from Yang-na in different directions, namely, that leading to the San Fernando Valley, to San Gabriel, to San Pedro, and Santa Monica, the country with broken hills and valleys extending toward San Bernardino, and the long flat valley in which Santa Ana lies, and which opens toward Capistrano and San Diego.

Another model might be made on a smaller scale showing the mountain rim, the three chief rivers rising in the mountain

rim and flowing across the Los Angeles Plain toward the ocean. This model might also take in the Santa Clara River Valley and the mountains on either hand.

Children living outside the Los Angeles Basin and not familiar with it should see modeled first the features of their own immediate environment, becoming able to see these in the sand table before taking up the Los Angeles region.

An imaginary coast line might be modeled, showing in one place an open bay and in another a bay with a narrow entrance. Show the children why in one case ships are safe and in the other not.

It might be explained why San Pedro Inlet was naturally shallow by telling about the work of rivers bringing down mud and silt.

NEW OR UNUSUAL WORDS

course	direction	headland	squarely	pointer
	marshy	extend	village.	

CHAPTER IV

THE MAGIC CITY

MORNING COMES on our mountain top. The sun looks over the far snowy peaks and awakens us. The fog still hides the valleys as it did when we went to sleep. The sun shines on its waves as it does on the waves of real water. We can not at first think where we are. It seems as though we are on a desert island where we have been shipwrecked. Now we remember where we are. Now we remember we had climbed up from the Indian village. We remember how the country looked, dotted with Indian villages.

The air is fresh and cool. We ought to be well rested. But instead of that we are tired and lame. Our muscles and joints feel as if they have not been moved for a long time. Can it be that we have been here longer than we thought? Little do we realize what has happened since we went to sleep.

The sun warms the air. As fog does not like warm air it soon begins to melt away. The valleys begin to come into view. There they all are just as when we went to sleep.

We look for the Indian village. It ought to be at the lower end of the long narrow valley. At this place, you remember, it widens out and becomes a plain. The plain stretches away to the ocean.

Can it be that we are still dreaming? Everything

has changed as if by magic. There is no Indian village. In its place are huge buildings and spires. They have taken the place of the village. They spread over the country for miles on every side. The smoke of many chimneys rises in the air.

With our glasses we can see people moving along the streets. They look like streams of ants. Automobiles dash back and forth in the centers of the streets.

The magic did not stop with the Indian village. It has changed the country as far as we can see. When we went to sleep every valley had its Indian village. In the large valleys there were many of them. Now they are all gone. In their places are the towns and cities of the white people.

The river that flowed by Yang-na became lost in the marsh lands before reaching the ocean. The willows and tules that grew in these marshes are now gone. There are miles of vegetable gardens. Smooth straight roads cross them. Houses line the roads.

The little inlet or harbor once held Indian canoes. This inlet has been made larger and deeper. It is filled with great steamships. Factories and warehouses line the shores. A long breakwater now lies across the front of the bay. Behind this breakwater, ships lie at anchor and are safe from every gale.

The surface of the valleys does not look as it did. When we went to sleep the valleys were covered with brush or low bushes. In some places there was yel-

low sand. In others there were a few live-oak trees. The valleys are covered with gardens and orchards as far as we can see. They are dotted with homes of white people.

There are also homes of white people on the lower slopes of the hills. There are homes on the lower slopes of the mountain on whose summit we are standing. They overlook the Magic City. But the most of the hill and mountain slopes are still just as Nature left them. They are rocky and covered with bushes.



The Hollywood Bowl where many concerts and lectures are held. If you were on the top of one of the hills and looked down into this valley you would understand why we call it a "bowl." There are hills all about it, except on the right, where it leads down to Hollywood.

Some of the valleys are dotted with tall oil derricks. There are many hundreds of them. They often rise from the midst of gardens and orchards. The Indians made no use of the rich valley soil. They had no use for the petroleum hidden far under the ground. When the white man came gardeners cleared the bushes away. They planted vegetables and fruit trees. Then after a time deep wells were drilled and petroleum was found. Some of these wells reach a mile down into the earth. Now these valleys give of their riches from the top of the soil, and also from the rocks far below it.

Dusty paths once led the Indians from one village to another. They were rough and crooked. Now we can see smooth straight roads everywhere. They run through the orchards and past the homes, making it very easy to go from one town to another.

Electric cars pass here and there. Long trains of cars pulled by puffing engines follow shining tracks. These tracks all start from the Magic City. They spread out every way like the spokes of a wheel.

Some of the roads are crooked because they go around the hills instead of over them. They reach every valley. They go into all the mountain canyons.

There are low places in the rim of mountains. These mountains, you remember, shut in the land we are talking about. The Indians once traveled through these low places or passes. Now automobile roads make use of the passes.

The people that built the Magic City came through

these passes from far-away lands. We imagine we can see loaded trucks traveling on the roads. They are all loaded with goods or produce. Some are bringing the products of the lands beyond the mountains. Some are carrying away fruits and vegetables grown in the fertile valleys over which we are looking.

Is this a real land spread out before us? Might we still be dreaming? Or, might we have been carried away in the night to some other land? You have



The new Los Angeles City Hall. The top of the great tower gives the best view of the city. From it you can see how great our city really is.

read of the magic carpet. Will we awake and find this Magic Land changed back to the land of the Indians?

Ask your teacher to tell you the story of Rip Van Winkle. Ask her to tell you a story of magic from the Arabian Nights. Can there be any more wonderful magic than this which we have seen from our mountain top?

Perhaps you can now tell the real name of the Magic City? If you can you know where the Indian village of Yang-na was. You know the river that flowed by the village. You know the name of the harbor where great ships come and go. You know the name of the mountain where we went to sleep. You know the beaches where you love to go on a warm summer day.

You know some of the towns and cities that lie around the Magic City. We might call them its children. Some of you know of other cities that we could not see from our mountain top. Some of you know of the land beyond the farthest mountains.

I am sure that you will agree that the Magic City is a real city. I am sure that you will agree that your fathers and mothers must have worked very hard. How people must have worked while we were asleep on the mountain top! Nature did all she could to make the land a beautiful place in which to live. But how much more beautiful our grandfathers and our fathers have made it.

SUGGESTIONS TO THE TEACHER

Continue the sand modeling until the pupils of each local area can visualize the surface features of their home district in the sand relief.

Get the children to discuss the difference between fog and clouds.

Let any of the children who have been above the fog, so that they could look down on it, tell how it looked.

Get the children to explain why most roads go around hills, although it is farther, instead of going over them.

Explain the use of the oil derrick.

THINGS TO TALK ABOUT AND DO

What does the sun do to the fog that makes it melt away?

Why does the fog hunt the low places in the land at night? Are the low places colder or warmer at night than the hilltops?

Why are valleys warmer at midday than are the tops of hills?

Bring to the class any pictures you can get of the Magic City, also of a city taken from an aëroplane.

How long do you think the people on the mountain top slept?

How could they tell when they woke up that they were in the same place in which they went to sleep?

Why did the Magic City grow up in the place where the village of Yang-na had been? Are there not other places in our land just as good for a great city?

Can you now tell the real name of the Magic City? Could this city be San Diego, Long Beach, Santa Monica, Ventura, Santa Barbara, Pasadena, Glendale, San Bernardino, Riverside, or Santa Ana? What makes you think it must be Los Angeles?

NEW OR UNUSUAL WORDS

awaken	remember	muscle	joint	spire
	breakwater	derrick	pass	

CHAPTER V

A LITTLE VILLAGE OF LONG AGO

THE MAGIC CITY spreads far and wide over the valley. Its arms reach back into the side valleys. It climbs the hills that rise on the sides of the valley.

All the Indian villages have gone. We sometimes see Indians in their odd dress, but they are not the Indians whose fathers and grandfathers lived here. They have come from some other part of our country.

How quiet was the country when only Indians were here. How full of life and noise it has now become. The white men made a great change in a few years. How they must have worked. They must have surprised Mother Nature herself.

How did our Magic City begin? Did it spring up in a night like a mushroom? The city began as do other cities. It is like other cities in most ways. It is unlike most other cities in one way. It grew very fast.

We might compare our Magic City to a seed that fell in a good place. This seed had good soil. It had plenty of water and warm sunshine. It grew quickly to be a giant among plants. So it was with our city. It is still growing. Who knows when it will stop? Are we not right in calling our city the Magic City?

Yonder is an old man. He was a little boy here

long ago. He can tell us about the village of white people that took the place of the Indian village. He can tell us about the kind of home he had, and of the dusty streets in which he played. He can tell us how the village grew into a great city, the great city that we saw from the mountain top. This man's father came with the first white people. Would you like to hear his story?

The city was started by twelve men. These men brought with them their wives and children. The men had once been Spanish soldiers. Now they had been sent to start a village in this new land. They



This is the first picture that was ever made of Los Angeles. Do you think it was a city then or only a little village? You can see the plaza in the center and the church on one side. This church is still standing, but the present plaza does not look at all as the plaza did long ago.

were to live upon what the land could supply them. So they became gardeners, farmers, and herdsmen.

These colonists came from Mexico to San Gabriel by land. Where is San Gabriel? It is on the slopes of a beautiful valley. Back of it are steep, high mountains. Mission San Gabriel was built where there was water and good soil. All about it were groves of oak trees. Many Indians lived there.

Why do you suppose the Governor of California sent this party to start a new village at Yang-na? He thought that sometime California would be filled with people. He thought that sometime there would be a great city in this land. He thought that Yang-na was a better place for a city than San Gabriel. Can you give some of the reasons why?

The journey from San Gabriel to Yang-na was a short one. Picture in your minds how the party traveled. There were no roads of course. Some of the people were on horseback. Some of them walked. Perhaps there was a squeaking cart or two drawn by oxen. There was also the little herd of livestock.

The party at last reached and crossed the sandy river. It stopped near the village of Yang-na. The place was a little below where the great new city hall now rises so high in the air. Here was a nice, level place for a village. It was also a good place for gardens.

Each family had two oxen, two mules, two mares, two sheep, two goats, one calf, and one donkey. There was only one hoe for each family. There were

some carpenter tools and also iron parts of farm tools. They had to make their furniture and all the other things they needed.

The village was given a long name. It was called in Spanish—*El Pueblo de Nuestra Señora la Reina de los Angeles*. This means—The Town of Our Lady the Queen of the Angels. It was a pretty name, but too long. It was finally shortened to Los Angeles.

The first houses in the new village were small and poor. Some were little better than the shelters of the Indians. Others were made of mud bricks. The name we give this mud is *adobe* (à-dō'-bě). The roofs were flat. Willow poles were first laid on the tops of the walls. On these were placed small branches and rushes or tules. Then a layer of dirt was spread over all. How do you think they kept out the rain?

Not far away there were some curious springs. A soft black tar bubbled up with the water. When the sun shone upon the tar it was quite soft. Men dipped up this tar and took it to the village. They spread it over the clay or dirt roofs. No water could then get through.

The floors of the houses were made of clay, packed hard and smooth. There were no stoves. There were no fireplaces. What did they do when they wanted to get warm or cook their food? Fire was made on the floor in the center of a room. The smoke found its way out through a hole left in the roof. Holes in the walls were the only windows they had. In pleasant weather fires for cooking were made outside.

For shade they stuck poles in the ground. On the top, other poles were laid, and then leafy branches.

The houses of the village were built around an open square or *plaza*. This plaza was used for all sorts of purposes. The children played there. The grown people had some of their games there. Here it was that festivals were held.



The great grizzly bear that once wandered over all parts of our land except the desert. His home was in the thickets of trees and brush along the streams. One could hardly go anywhere without meeting these bears. They seldom made trouble for anyone except when attacked. It is too bad there are none left in California. They are very interesting creatures.

Streets led away from the plaza. They ended in the open country where no one lived. These streets were sandy, dirty, and dusty. They were little used except by horsemen and cattle. Once in a while there was a huge squeaking cart to be seen.

The Spanish missionaries had brought seeds and plants to San Gabriel from Mexico. These seeds had reached Mexico from their old home in Spain. Some of these seeds and plants were taken from San Gabriel to the new village of Los Angeles.

The wild seeds need no care from men. But garden seeds, plants, and fruit trees must have water in the long, hot summer. Water for irrigation could not be carried by hand as the Indians carried the little water they needed. What was to be done?

Some of the men had come from Spain. In their homeland the summer was dry like the summers of the new home in California. Because of this they knew just what to do.

They first went up the river some distance. Here they built a small dam. Then they began digging a ditch. They sloped it just enough so the water would run into it. The slope was a little less than that of the river. They led the ditch down to the village. Here they divided it into small ditches. One of these small ditches ran by each house and to each garden.

The soil was loose and easily plowed or turned over with a spade. It was very fertile and the sun shone warm. How the seeds and plants grew!

In a little time the village of Los Angeles seemed

quite like home to these people. There was plenty to eat and drink. The willows grew up along the ditches and made a shade from the hot sun. They also served as fences between the gardens.

In the gardens were orange, lemon, lime, citron, pear, apple, fig, peach, olive, and walnut trees. There were vineyards of the sweet mission grapes, and rows of vegetables of different kinds.

Outside of the village were fields of wheat. This wheat was at first ground the way the Indians ground their grain. Can you tell how this was done? After a time a little mill turned by an ox or donkey was used. Below the village a small mill was put up by the side of the river. The millstones were turned by a water wheel.

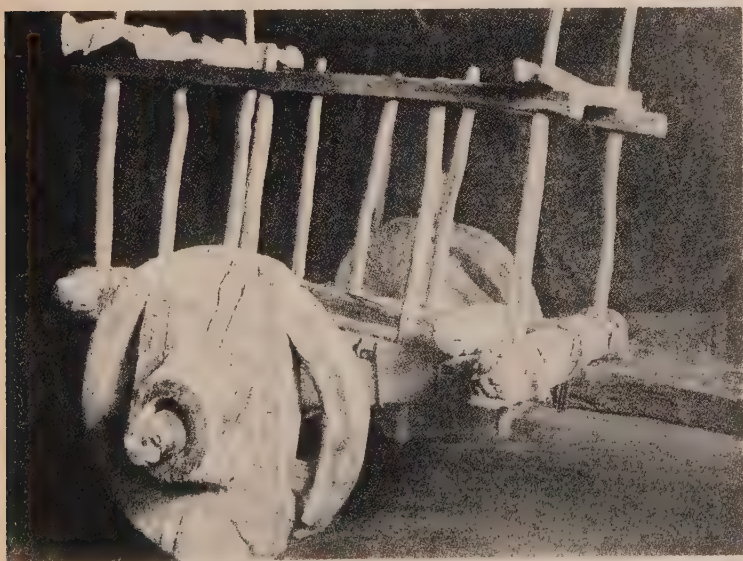
The ditch water became very warm in summer. To make it taste better some was put in large jars or *ollas* (ól-yas) made of baked clay. You can see ollas used now in parts of our land where Mexicans live. The ollas were hung in shady places. The clay of which they were made had tiny holes in it. Through these holes water particles crept slowly out of the jars. They were carried away in the air. This cooled the water that was left in the jars.

Sometimes the ditch water was not clean and good for drinking. At such times men went from house to house selling drinking water to those who wanted it. They carried this water on the backs of donkeys. They brought it from some pure spring.

The cattle, sheep, horses, and goats that the set-

tlers brought increased in number. After a few years there were more than could be counted. The San Gabriel Mission became very rich. The cattle wandered freely over the country. There were no fences to hold them. The sheep and goats were herded by the Indians. The coyotes were always watching for the sheep. They would kill and eat them whenever they got a chance. There were gay festivals when the sheep were sheared or the calves were branded.

It was a happy, lazy life in the village or pueblo of Los Angeles. Most of the time there was little



What curious things the carts were that were used in the Old Spanish days. They went creaking along, drawn by slow oxen. Can you tell of what the axle and wheels were made?

to do besides tend the gardens and vineyards. Everything had to be watered often during the summer.

People sometimes rode in the slow, creaking ox-carts. But usually they went horseback. The men and boys took great pride in their horses. They became fine riders. The saddles and bridles were beautifully made. Many could ride well with nothing to which they could hold except a strap around the horses.

What games do you think were played? There were all sorts of games with horses. Racing was one of the most exciting of the games.

There were also bullfights just outside of the village. The bulls were very wild and savage. Once there was a fight between a bull and a bear. The bear had been caught and kept for this purpose.

Cock-fighting was another game the men enjoyed very much. This was just as cruel as bull-fighting, but was not so dangerous. Everyone bet on these games.

THINGS TO DO AND TALK ABOUT

What do we mean by *adobe* soil? Is adobe a good or bad soil? Adobe is hard when it is dry. Is this the reason it was used for bricks? Why do the men mix straw with adobe when makings bricks?

Make a Mexican home such as you have seen in some photograph.

Why was little wood used in making the homes?

The walls of the adobe houses were plastered smooth with mud. Then they were whitewashed. The whitewash made them

look better and kept the rain out. It acted like the plaster or stucco that we put on our houses.

We use tar on our roofs now. Do we spread it on dirt or on something else? Tell what you know about roofing paper.

Tell how tile roofs are made to shed rain. Some of the best houses were roofed with tiles. Why are tiles better than wooden shingles or tarred paper? Do you know of anything else of which roofs are now made? What kind of a roof has your house?

Which is cooler in summer, a house built of wood or one of adobe bricks? Which is warmer in winter? Can you tell why?

Lay out on the sand table an imaginary village with an open square in the center. Put the church on one side of the square. On the other side the chief stores. Lay out the roads running away in every direction.

All villages and cities in which Spanish people live have squares in the centers. What was the use of these?

There is little of the plaza now left in Los Angeles. Let someone who has seen it tell what he can about it.

The Spanish padres carried out the old saying: "Plant a vineyard for your children, an orange grove for your grandchildren, and olive trees for posterity."

When one speaks of *posterity* he means the people who live on the earth after him.

What do you think this old saying means?

NEW OR UNUSUAL WORDS

surprise	livestock	irrigation	squeak	furniture
	curious	weather	increase	

CHAPTER VI

HOW WE HAVE CHANGED OUR LAND

PART FIRST: *The Land Itself*

MOTHER NATURE is always at work. But she works very slowly. If you could live a thousand years you would wonder what she had been about all the time. The mountains and valleys a thousand years ago were just where they are now. The ocean was in the same place. The same winds were blowing. The winter rains were the same, and the summers were warm and dry as they are now.

You cannot see the hour hand of a clock move. But you know that it does move. It is the same way with Mother Nature. She is slow and quiet. The waves are tearing down the ocean cliffs. Mountains are growing and the rains are tearing them down. Every time it rains, a little soil is washed down the slopes. Some of it helps fill up the valleys. Some of it is carried to the ocean. There it sinks and helps make the bottom smooth and even.

Mother Nature makes hollows in the land. She lets the water run into these to make lakes. She finally fills the lakes up with the soil washed down from the hills. Sometimes she makes mountains too steep. When such a mountain becomes very wet a part of it may slide down. Sometimes she seems to

get nervous and shakes things. Then we have an earthquake.

Mother Nature also rules over the living things. She causes those to die who are no longer happy in their homes. She puts others in their places. By and by we shall visit the springs where the people of Los Angeles once got tar for the roofs of their houses. In the tar of these springs we find the bones of the animals and birds that lived a long time ago. These bones are unlike those of the animals that live here now.

Our land was the home of Indians for a long, long time. They were like a lot of children. They had few cares. White people made their lives unhappy and so they died. They left everything just as they found it. They did not disturb the soil or the plants. They killed only a few of the animals and birds.

White people have lived in our land a very short time. They have done a great many things. Some of these are good. Others are bad. In some ways they have helped Nature make a better land. But they have broken many of her laws.

What have white people done to this land? Let us first look at the surface or the slopes. After that we shall talk about the animals and plants that live on these slopes.

Let us imagine we are up in a balloon a mile above the Magic City. From here we can see the country as the eagle sees it.

The first thing that we see is the wonderful city beneath us. The first white men who came to the Indian village of Yang-na thought this a fine place for a great city.

Our city lies where three great lowlands meet. We have already learned of the Los Angeles Plain that stretches away to the ocean. We have learned of the great round valley that is called the San Fernando Valley. We have seen the valley of the Los Angeles River that leads down to our city. We have learned of the valleys that reach eastward to San Bernardino Valley. We have learned of the twin peaks that lie beyond this valley. We have seen the rim of mountains that shuts in our world on the north and east. We might call these mountains our back wall.

The plain that leads to the ocean is on the south. This is the Plain of Los Angeles. We might call it our front door because it faces on the ocean.

Rivers flow through these valleys to the ocean. They collect the raindrops and carry them back to the ocean. They do not get all the rain, for some escapes in the dry air. We are now doing all we can to save what the air does not get. By and by the rivers will have little to do. We shall take their water away from them and use it all for watering our gardens and orchards.

The Los Angeles River is a strange one. It plays at hide and seek. It has different names in different places. It starts in the high mountains on the north. There it is called the Tujunga River. Trees and rocks

shade it. But when it reaches the San Fernando Valley it meets the hot sun. To escape from the sun it creeps down into the sand, out of sight. We think the river is lost, but it is not. The water flows slowly between the grains of sand for many miles.

At the lower end of the San Fernando Valley there are springs. Here a part of the river comes out to the daylight and flows down past our city. We now call it the Los Angeles River. A part creeps on



This picture shows the Tujunga River as it looks after a storm. It is flowing down the San Fernando Valley without any banks. It may spread over farms and do much harm. The water is muddy in color and carries along also sand and pebbles. These fill the channel and make it overflow its banks.

down to the city through the sand. We catch much of this water and thus save it for the use of the city by pumping it from huge wells put down in the sand.

But the river is soon lost again on its way to the ocean. It spreads out in marshy places covered with willows and tules. In place of the marshes there are now vegetable gardens, homes, streets, and oil derricks. In winter the river is bolder. When it rains very hard it becomes a muddy torrent. It reaches San Pedro Bay. Men have now made a great harbor out of the shallow little inlet or bay. If the river were a living thing it would not now know the bay into which it used to flow.

Let us look again at the circle of mountains. These shut in the three great valleys that we can see from our balloon. But we must not think that this is all of our Southern California home. This is the middle part. It has the highest mountains and the largest rivers.

The Santa Ana is the largest and longest of all our rivers. Its water makes a shining ribbon from the highest mountains to the ocean. It flows through many valleys and brings life to many orchards, towns, and cities.

I wish you could go with me and see the great spring where this river is born. There is no other like it in all our land. This spring is high up in the San Bernardino Mountains. It is in the midst of forests and rocks. It is delightful in summer. In winter it is cold and snowy, like the Far North.

Let us turn now toward the high peak we call Old Baldy or San Antonio. Here another shining ribbon of water starts to join the ocean. We call this river the San Gabriel, and the mountains have the same name. We can get a good view of the river and mountains from Mount Wilson.

The Spaniards gave the name *Sierra Madre* to the whole range. The San Gabriel Mountains form a part of the Sierra Madre. The word "madre" means *mother*. This is a very good name because Nature made them first.

What do you think lies outside our circle of mountains? Beyond these mountains toward the east are great dry valleys. We once called this land the Colorado Desert. Now we call it Coachella and Imperial valleys. By and by you will learn more about this garden spot that was once a desert.

Away to the south is San Diego. This place we might call the Mother of Our Land. For it was here that white people first landed. Many mountains and valleys lie between us and San Diego.

Beyond the mountain wall on the north is another great dry valley. This we call the Mohave Desert. Mountains supply water to a part of this desert. This part we call Antelope Valley. You will want to learn why this desert is so unlike the Colorado Desert. You will want to learn why it is so much colder and why its products are quite different.

Away toward the northwest is another part of our land. Mountains shut this away so that we can-

not see it from our balloon. You all know of Santa Barbara. You have heard what a beautiful place it is. On your way to Santa Barbara you have to cross a large and fertile valley. This is called Santa Clara. At its farther side is the city of Ventura, where there is an old mission.

This is a picture of the slopes of our land. Each of you can add to this picture many things that you have seen on your home slope.



You have been learning about the rivers sinking in their sandy beds in summer after they leave the mountains. This is a picture of the Tujunga River flowing from the mountains out into the San Fernando Valley. You have learned that farther down toward the ocean we call it the Los Angeles River. The picture shows the water sinking in the sand. After a heavy storm in the San Gabriel Mountains which you can see in the distance, you can follow the water all the way down to Los Angeles.

White men have done many things. But they have not changed the slopes of the land. These look just as they did when the Indians were here. One of the things white men have done is to make lakes or reservoirs. Can you tell where Lake Arrowhead is? Can you tell where Big Bear Lake is? Why did men make these lakes? Do you know any other lakes or reservoirs? Did men or Nature make Lake Elsinore?

Men are now making dams in many mountain canyons. Water will gather behind these dams and form lakes. The highest dam in the world is to be built in San Gabriel Canyon. This will catch and hold the rain water, so that it cannot rush down in floods, as it does now, injuring roads and crops, and finally losing itself in the ocean. The dam will hold it safely until it is needed, a little at a time, during the long dry summer.

PART SECOND: *The Living Things of Our Land*

Let us now learn something of the living things that Nature placed in our land. Have we done anything to these? The story of what we have done is a sad one. We have killed more in a few years than Nature would have killed in thousands of years. Some of us are cruel. Some of us are thoughtless. Many of us do not know how we should treat the living things about us.

Some of the living things are harmful, and it is best to kill them. But most of them are either use-

ful or they add to the beauty of the world. This is true of the plants, animals, and birds.

Gardeners have cleared away the willows, brush, and tules that once grew upon the low moist lands. In their places are now great fields of celery, lettuce, cabbage, cauliflower, spinach, beans, and corn.

The drier parts of the valley slopes were once covered with many kinds of brush or bushes. These lands are now planted to fruit of every kind of which you can think. Water has been brought to these lands in pipes or ditches. Every tree is given what it needs in order that it may repay in delicious fruits.

Nature planted few trees near the ocean. This is because the rainfall there is small. But as we go toward the hills and mountains we find more of them. We can tell from far away where each stream is by the oaks and sycamores that grow along its course. Many of these trees have now been cut down. Why do you suppose people did this?

Many of the lower hills near the ocean have a dark claylike soil. This is the soil that we call adobe. When mixed with straw it makes good bricks. The wild oats delight to grow in adobe soil. In the early summers of long ago there were miles and miles of Nature's waving grain.

Nature did not plant most of the trees that you now see growing in our valleys. All but the oaks and sycamores have been brought from distant countries. Orchard trees have been planted for the fruit they yield us. Wayside trees have been planted for

their shade. Many trees have been planted about our homes to make them more pleasing.

Think how the country must have looked without these trees. The Spanish settlers came from a land where there are few trees. They did not mind the open treeless slopes. But the most of us are used to trees. We feel lonesome without them.

In the springtime our land was once a garden of wild flowers. Many of these flowers are now almost gone. Cattle have eaten them. Farmers have plowed them up. Children have picked more than they should.

Most of our garden flowers have been brought here. They add much to the beauty of our homes. But they cannot take the place of Nature's wild flowers. We ought to have more parks where both the wild flowers and wild animals and birds could live and grow in safety.

We have worked with Nature in the valleys. We have made them more beautiful and more fertile. But in the mountains we have done great harm. We have broken her laws. She has said the slopes must be covered with vegetation. The rain water runs off quickly from bare slopes. It carries the soil with it.

We have let fire sweep over the slopes. We have let lumbermen cut down the trees. We have let sheep and cattle kill the young trees and eat the grass into the ground. We shall learn more by and by about how our very homes depend upon helping Nature take care of the mountain slopes.

You remember the old man who told us about the village of Los Angeles and how it started. Let us get him to tell us about the animals and birds that were here when he was a boy.

He says that this was the happy home of wild things before white people came. The Indians hunted them. But they killed only as many as were needed for food. The Indians used bows and arrows and made rude traps.

The old man says that the wild animals and birds were thicker than we would ever dream. There were many kinds that we do not see here now. Thoughtless white men have killed them. They did not do this to get food. They killed many for their skins. Others they killed for what they call sport. The grizzly bear they thought dangerous. But he was harmless if let alone. Bears lived upon roots, berries, nuts, and acorns. Their homes were in the thickets or brush near the streams. Now the grizzlies are all gone. There are a few of the brown bears left in some parts of our mountains. They are also harmless. But the hunters think they eat calves and sheep, and so want to kill them all.

There were once black wolves. But they are now all dead. There are a few coyotes left. They are so cunning that they get along pretty well. They once lived on jack rabbits and ground squirrels. Now they prefer chickens and calves. We might take better care of our chickens and calves and let the coyotes live. Then there might be enough of them to

keep the squirrels and rabbits from eating so much of our grain. Do you not think the coyote might be worth his keep?

Have you ever seen antelope? They are graceful as the deer and can run very fast. There were many of them in the San Fernando Valley. Our antelope are now all gone. There were a few elk. You know how large these animals are and what great antlers or horns they have.

The geese and ducks were so thick they almost



Did you ever see a larger spring than this? It is the starting point of the Santa Ana, our largest river. The water comes from melting snows. It creeps down into beds of gravel and finally comes out to the light here. Such springs keep up the summer flow of our rivers when the orchards need the water.

covered the marshes and ponds. Some kinds of these birds are gone from our land. We never see the beautiful wild swan any more. You could hardly count the quail that used to come to the springs to drink.

Some people would like to kill the beautiful song birds. They shoot them, put out poison, and keep cats that catch thousands of them. We ought to let the birds have a little fruit if they wish it. They eat a great many harmful insects and worms. Our world would be lonely without them.

Most wild things do not love the white man. Can you blame them for keeping out of sight? We should have many game preserves and sanctuaries for the wild animals and birds. In these places they can live and raise their young safe from the hunter.

SUGGESTIONS TO THE TEACHER

Model roughly the whole of Southern California. Show the main water parting or watershed, and the chief ranges of mountains. Put in the rivers spoken of in the text.

It might be best to model the Tujunga-Los Angeles River basin by itself so as to make it larger. The children will be interested in the peculiar behavior of these rivers.

Begin with the Tujunga River flowing westerly from the San Gabriel Mountains. Explain why it sinks into its sandy bed upon entering the San Fernando Valley. The valley bottom is made up of sand, gravel, and boulders to a depth of hundreds of feet. During the most of the year the water of the river creeps through this material for many miles. Finally at the lower end of the valley, where it meets harder material, it is forced to the surface.

It now flows above ground for ten miles. Then below Los Angeles it spreads out on the plain and sinks into the sand again.

During flood stages it flows on the top of the ground across San Fernando Valley, as the people of Lankershim and vicinity know to their sorrow.

During floods the river flows over the plain below Los Angeles and reaches the ocean at San Pedro.

Discuss with the children the great importance, from different points of view, of a flood-control dam in Tujunga Canyon.

THINGS TO DO AND TALK ABOUT

Have you seen Mother Nature make any changes in the earth?

Tell about any earthquakes that you have felt.

Have you seen any hollows in which water has gathered and made ponds? Have you seen any of these ponds that the rain water has filled up with mud and sand?

Find out what makes a balloon rise. How do the people in it make it come down?

Why did Nature cover the most of the valley slopes with bushes and put all but a few of the trees in the mountains? What do you find growing upon the lower slopes where the soil is rich and there is more water?

When you see a willow what does it tell you about water?

What do cactus plants growing wild tell you about the rain? Is there much or little?

Name some of the bushes you have seen growing upon the dry valley slopes. The manzanita bush grows very large roots. People dig these roots for wood. They burn almost like coal.

Why is it better to pipe water to your garden than to take it in a ditch?

In what two ways is water lost from an irrigating ditch?

Where did Nature plant the most of the valley trees?

The marshes were once the home of ducks, geese, and other water birds. Where do they now make their nests since the gardeners have turned the marshes into gardens?

Where does the quail build its nest? Where is the home of the mocking bird? Did you know that pussy is the worst enemy the birds have? Nature gave the birds many enemies. Among these enemies are the snakes, some of the hawks, the bluejays, the butcher birds. We ought either to keep cats shut up or feed them so well they will not catch birds.

It is not right to put out poison for birds, even if they do eat some of our fruit. The most of them do more good than harm. Besides we have their songs.

Poison kills the innocent as well as the guilty birds. We ought to find some other way to save the fruit.

NEW OR UNUSUAL WORDS

earthquake	disturb	surface	imagine	lowland
stretch	cover	sanctuaries	injure	delicious

CHAPTER VII

WHERE THE FIRST WHITE PEOPLE MADE THEIR HOMES

THE INDIANS lived in villages. Why do you suppose they did this? Was it for the same reason that many white people like villages and cities, or was it for safety?

The Indians chose places for their villages near springs or living streams. They thought of water first just as we do, but they paid no attention to the soil.

Near water the ground was wet or damp. This made the bushes and grass grow better. The grass-eating animals came to such places for their food. The flesh-eating or carnivorous animals also came because they found more of their kind of food here than anywhere else.

Some of the streams had fish and these could be caught in traps. Many kinds of birds sought the water for their food, and their nesting places were here.

The Spanish padres or missionaries came to California to teach the Indians to live better. They wanted them to dress better, live in better homes, to cultivate the soil, and to go to church.

But the missionaries had to have food. This could not come from Mexico or from Spain. All their food must be grown in their new home. They had to

think of many things in choosing places for the mission churches.

They soon found out that the climate of this new land was like that of their old home in Spain. There as well as here the rains came in the winter. The summers were dry. Because of this the first thing that must be thought of was water for irrigation. Besides this the sun must be warm and the soil must be good, and finally the missions must be near the villages where Indians lived. They must also be within a short distance of the coast. The padres came by boat, and this was the only way by which they could get the many things they needed from Mexico.

The padres came by water. The first bay they reached had been discovered and named San Diego by Vizcaino long before. And as it happened this is the best bay Nature gave our homeland. And so the padres did just what you would have done. They stopped here and built a mission. Then they continued their journey by land.

But why did they not build this mission on the shore of the bay? A river entered the bay, but there was no water in it in summer. To be sure, water could be had in wells, but this would not do for irrigation. Besides this there were no Indians living close to the bay. And so they went up the valley of the river until they came to running water and to Indian villages. Here they built the San Diego Mission.

From San Diego the padres went toward the north. In some places they traveled along the coast. In other places they followed valleys that led them back toward mountains. Wherever they found good soil, water, and Indian villages they built a mission. Finally there was a long string of them.

Let us follow the padres and see where the missions are. We come first to the Mission of San Luis Rey. It is in a large and fertile valley where there is plenty of water.

The next mission is that of San Juan Capistrano. This was built in a fertile valley by a little stream.



An irrigation canal that carries water to the orchards around Riverside. You can see how much water it takes to keep the orange trees growing and make the fruit large and juicy. We must save all the water that falls on our mountains. We must keep them covered with forests.

The country around is pretty and there were many Indians.

Perhaps you wonder why the padres did not stop at San Pedro Bay and build a mission. There was a little inlet or bay here, but it was shallow. Only small boats could enter it. There were many Indians, but there was no water for irrigating gardens. The country was low and marshy. It did not look pleasing to them.

From San Juan Capistrano the padres went north until they came to a river which they named the Santa Ana. They followed up this river a few miles. Then they turned toward high mountains which rose on their left hand.

At the foot of these mountains the padres found everything they wanted. And so they stopped and built a mission. They called this San Gabriel. There are four things in this part of our land that have the same name. The first is the beautiful San Gabriel Mountains. The second is the San Gabriel River. You have heard of the great dam they are going to build in the canyon of this river. The third is the San Gabriel Valley. The fourth is the San Gabriel Mission.

Then the padres turned west from San Gabriel Mission. They soon came to the Indian village of Yang-na. They did not build a mission here. But they thought it a fine place for a city.

They came next to the great round basin or valley that we call San Fernando. In the northern part of

this valley they came to water, fertile soil, and Indian villages. Here they built the San Fernando Mission.

The padres journeyed on in a direction between north and west. They soon came to mountains. After they had gone by the mountains they came to a wide and flat valley. They called this the Santa Clara Valley. Near the ocean the valley is so wide it seems like a plain. Some of you know what is now grown in the rich soil of this valley.

On the north side of the valley near the ocean they built another mission. This was called the San Buena Ventura. Ask some one to tell you what this name means.

Beyond Ventura the mountains come down to the ocean. They almost had to wade in the ocean to get around these mountains. Beyond the mountains they came to other valleys.

Finally the padres reached a beautiful country. It was partly a plain that sloped down to the ocean. It was partly low hills with little valleys between them. These hills rose on the north and made a line of high mountains. Here they built the Mission of Santa Barbara. The padres were happy here. The climate was pleasant. The soil was good and the water came down in little streams from the mountains. Besides all these things there were many Indians. This was not the end of the Camino Real. But it is as far as we shall go. It passed by other missions and at last came to San Francisco.

The padres tried to get the Indians to leave their villages and live at the missions. Sometimes there were more than one thousand Indians at the larger missions. Much food was needed for so many people. And so the Indians were set to work. They helped put up the buildings. They worked in the gardens, orchards, vineyards, and grain fields. They herded the goats and sheep. There was soon plenty of everything except milk. Some of the goats were milked, but the cows were too wild.

After a time Spanish settlers began to come. A



Do you not think our land is very beautiful? Nature made the lofty mountains and the fertile valleys. Men brought water that the mountains supply, planted trees and gardens, made smooth roads, and built pretty homes. Thus Altadena, at the foot of the San Gabriel Mountains, is a very pleasant place in which to live.

village grew up by San Diego Bay. This village was close to the mouth of the San Diego River. Here the bay was shallow, but the soil was good and there was water to be had by digging wells. This place is now called Old Town or Old San Diego. The new city of San Diego was started on the bay three miles away. I am sure the San Diego children know why this place was chosen.

We have learned how Los Angeles began. Let us think again why this was a good place for a city. Picture in your minds the valleys that meet here. Picture the stream of living water. Picture the fertile plain that stretches away to the ocean. Picture the place of the village as a natural meeting place of highways or roads. The chief highway led from San Diego to San Francisco. This was the one the padres traveled. And so it came to be called the Camino Real or King's Highway.

The years went by. Little by little more people came and made their homes in Los Angeles. Its gardens, orchards, and vineyards were larger than any others. For years Los Angeles was only a village. But it was the largest village in all our homeland.

We have learned of the fertile valleys around Los Angeles. Here and there a farmer or ranchman made his home. Cattle, sheep, and horses were raised. There was no market for the flesh of the cattle and sheep. What do you think they raised them for? What was the chief use to which horses were put?

Water was the first thing the Spanish rancher thought of when choosing a place for a home. The next thing he thought of was grass for his cattle. They must have a good range or pasture. He paid little attention to gardening or fruit-growing.

We have now learned what guided the Indians in choosing places for their villages.

We have learned what guided the Spanish padres in choosing sites or places for the missions.

We have learned what guided the Spanish settlers in choosing ranches and villages.

Our fathers, the first Americans to settle here, thought little about water in their Eastern homes. Sometimes they had too much water. But when they got to California they found a land unlike their homeland. They had to learn many new things. They learned to think of water first of all. They did as the Spanish settlers did. They looked for land that had living springs or streams upon it.

The first settlers had to make their homes close to where Nature had put water. They could not make great ditches and carry it many miles. But after a time more people came. Many people could do things that a few could not do.

Now we carry water to every place we wish. We can make our homes anywhere. We cannot make Nature give us more water. But we make better use of the water that she supplies us. We make great cement pipes for it to flow in. We make tunnels through mountains that are in our way. In some

places the water is not needed. We take the water from such places and carry it to the places where it is needed most.

SUGGESTIONS TO THE TEACHER

Model on the sand table the route of the padres from San Diego to Santa Barbara. Show the chief valleys they went through and the rivers they crossed. Show how they got past mountains, and where, as between Ventura and Santa Barbara, they went down to the edge of the ocean.

Let those children who are familiar with the sites of the different missions tell the others what they know about them. Find out what they think about the locations of the missions, whether they are good or bad.

Let the children model in clay the land features about any mission with which they are familiar.

If any have seen an old Spanish ranch house, ask them to tell about it.

THINGS TO TALK ABOUT AND DO.

What things guided the Indians in choosing places for their villages? What things guided the padres in choosing places for their missions? What things guided the Spanish rancher in choosing a place for his home? What things guided the Spanish in choosing places for pueblos or villages? What things guided the American farmer in choosing a place for his home?

Do you think the King's Highway was a good road, or was it no more than a track?

How do you think people traveled? How were goods carried?

NEW OR UNUSUAL WORDS

attention continue string settler tunnel

CHAPTER VIII

DID NATURE SUPPLY OUR HOMELAND WITH EVERY-
THING WE WANT?

THE INDIANS wanted few things. They had little use for clothing. They lived much as the wild animals do. The air was warm most of the time. But when winter came there were cold days and nights. Then they made for themselves blankets of rabbit skins or of the skins of larger animals.

Nature provided the food of the Indians. All they had to do when hungry was to go out and get it. The plants gave them seeds, bulbs, and roots. The trees gave them nuts and acorns. They made bows and arrows with which they shot birds and wild animals.

Some of the streams had fish in them. They made traps to catch the fish. They traded with the Indians living on the coast. They gave these coast Indians acorns and nuts and got fish, clams, and mussels in exchange.

You have learned why the Indians always made their homes by some spring or stream. Willows grew where the ground was wet. From the willows they cut poles for the frames of their wickiups. Over the frames they stretched matting or skins. They used dry branches for fuel. They made some of their dishes of rocks hollowed out by hand. They wove baskets and used them for dishes. Can you think of anything more that the Indians really needed?



Picture of the Los Angeles Aqueduct, showing pipe.

There were many Indians in our homeland when the padres came. This tells us that Nature was good to them. They were contented because they had all they wanted. If there had been little food there would have been few Indians.

White people would not have been satisfied with what the Indians had. Do you think you would enjoy soup made of acorns and grasshoppers? How would you like to wear clothing made of skins or matting? How would you like to live in brush shelters plastered with mud or covered with skins?

The Spanish padres came from a land on the other side of a far-away ocean. They found out very quickly that California was like their homeland. It had the same climate. There were long dry summers and rainy winters as at home.

Because the two lands were alike the Spanish padres knew just what to do here. They knew that the same fruits, vegetables, and grains that grew at home would do well here. In their homeland every living thing had to be watered or irrigated in the summer. So the padres got the Indians to help them dig ditches to carry water to the newly planted gardens. Because the summers were dry in the homeland there were few trees except on the mountains. They built their houses of stones or adobe bricks. They covered the roofs with red tiles. The padres saw that they must build their houses the same way here. The poorer people could not afford tiles. So they roofed their houses with clay.

The padres and other Spanish settlers learned to love their new home. Nature with a little help took care of most of their needs. But there were some things the new home did not supply. How do you suppose they got them?

Trading ships came once in a while. They brought many kinds of things. There was clothing. There was calico and trinkets for the Indian women and girls. There was sugar, tobacco, spices, medicines, and toilet articles. The ships carried away hides or skins, tallow, and wool.



The forest that once covered these slopes on the top of the San Bernardino Mountains was not destroyed by fire but by the lumberman. You can see how thick the trees once stood. Now the rain water runs off faster than it used to. It makes the floods in the Santa Ana River worse and there is less water for the orchards down in the valley in summer. Do you not think we ought to keep the lumberman out of our mountains?

Leather was much used for clothing. This was because both wild and tame animals were abundant. The Indian women were taught to weave coarse cloths.

The first Americans lived much as the Spaniards did. The country supplied almost everything they wanted.

But by and by more Americans came. They did not like the adobe houses. They were used to living in wooden houses. You know that in the East it rains a great deal. This makes forests grow in the valleys and on the mountains. The trees were in the way of the farmer. He had to cut them down before he could plant seeds.

Oak and sycamore trees grow in our valleys. They do not make good lumber. Can you tell why this is? Where could the settlers find trees that could be sawed into good boards?

The padres had discovered that tall, straight pine trees grew in the mountains. They needed great timbers for the roofs of the missions. And so they sent the Indians to the mountains for them. They cut down trees and made them square with their axes. Then they put the timbers on their shoulders and carried them many miles down to the valleys. The work was very hard, for the trails were steep and rough.

The Americans made roads into the San Bernardino Mountains. Here there is the largest forest in all our Southern land. Sawmills were built. The

lumber was hauled down the mountains by ox teams. It took a week for a load to reach Los Angeles.

But after a time the cutting or lumbering of trees in our mountains was almost stopped. It was found that when the trees were gone the water ran away faster. Water is the most precious thing in all our land. The gardens and orchards need all that they can get. It is more necessary than lumber. We can get along without lumber. There are many other materials of which we can build our houses.

Do you know where the lumber that we now use comes from? Why is it brought by water? Do you know the two harbors where the ships are unloaded? It does no harm to cut the trees where this lumber is made. Can you tell why?

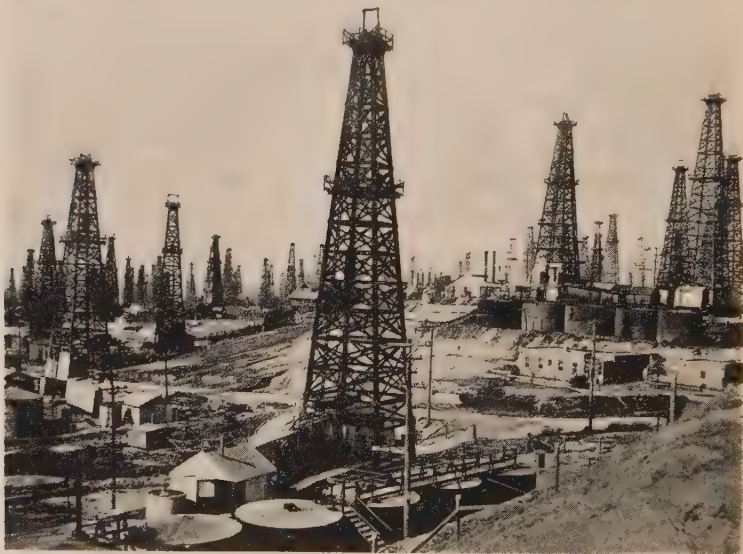
We use many shiploads of lumber every year. We should be careful not to waste lumber. We should use other materials in the place of lumber whenever we can. The forests that supply it may sometime be cut away.

Buildings are made of many different kinds of materials. Tell all that you can about each. Tell what you can about the walls and roof of some old Spanish or Mexican house that you have seen. Why do wooden shingles make a poor roof? Why do tiles make the best roof? Find out what you can about asbestos shingles and why they are so good.

Of what materials is your home made? Of what are the tall buildings in the cities made? In making tall buildings a steel frame is put up first. Why is

this done? Iron and steel are two materials that we do not make in California. Where do you suppose they come from? Which could we get along without easier, gold or iron?

Goods were once made or manufactured by hand. People usually worked at home. Now many people work together in buildings called factories. These buildings contain many kinds of machinery. Engines are used to make the machinery go. The en-



The oil field on Signal Hill, in the city of Long Beach, is one of the greatest in the world. Under each derrick there is a hole drilled deep in the earth. Engines pump the oil into the tanks. Pipe lines carry it to the oil tankers at San Pedro. These boats take it to any part of the world where it is wanted. From a part of the oil, gasoline and other products are made.

gines must have fuel. Coal or petroleum, or gasoline make the best fuel.

It was once thought that our land had little fuel. To be sure electricity is used to run much machinery. But for many purposes we must have cheap fuel. What was to be done?

You have already learned of the tar or brea springs near the village of Los Angeles. You remember what use the people made of the tar. The tar would burn when a lighted match was held close to it. This started people thinking. Some one discovered that the tar was oil or petroleum that had dried down. It bubbles up with water and gas from deep within the earth. Might we not find the place where the tar comes from by putting down a well? Deep in the earth the tar ought not to be dried out. It ought to be thin like petroleum.

There are many tar springs throughout our land. Wells were drilled near some of these springs. It was found that the tar came from layers of sand filled with petroleum and gas. The petroleum rose to the top in some of the wells and flowed out over the earth. This was because there was gas behind it trying to get out. Some of the wells had to be pumped just as we pump water. Petroleum has now been found in places where there are no tar springs. Some of the wells are a mile and a half deep.

An oil field is a place where there are many wells. What a strange sight the tall wooden derricks make. In some fields there are many hundreds of derricks.

Each one stands over an oil well. The oil and gas flow night and day. The gas is used for lighting and heating. The oil is used in our great engines. These engines do all kinds of work. A part of the oil is carried in pipes to San Pedro and Ventura. There it is put on boats and shipped to all parts of the world.

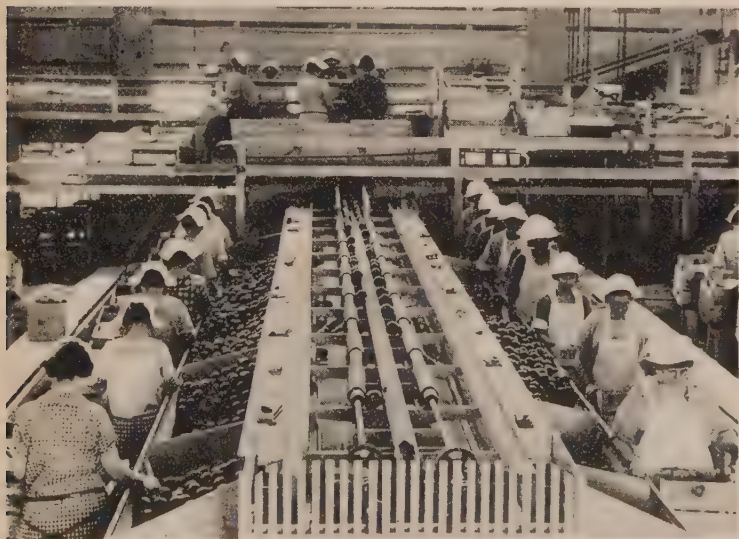
The lighter part of the oil we call gasoline. You all know what this is used for. Could we get along without gasoline? Many other products are made from the crude oil. *Crude* oil is the oil just as it comes from the ground. Getting the clear petroleum and gasoline from the crude oil is called *refining* the oil.

Do you know that our oil fields are among the largest in the world? How wonderful it is that we now have plenty of cheap fuel. Many great factories have been built. By and by there will be many more. The factories give work to many people. The people who work in the factories need fruit and vegetables. Every year there must be more gardens and orchards. Thus every year more people must come to work in the factories, shops, offices, gardens, and orchards.

Once there were few white people in this Southern California home of ours. Then the summer streams and springs supplied water enough for the gardens and orchards. When the winter rains came the clear summer streams turned to muddy torrents. Most of this water ran away to the ocean and was lost. No one then thought this water would ever be needed.

But we have seen how every year more people came to Southern California. Every year more water is needed. There is yet plenty of land for growing fruits, nuts, vegetables, and alfalfa. Water is the one thing of which we do not have enough.

There are twelve months in every year. Did you ever think that there are seven of these months in which little or no rain falls? This dry time comes in the summer when our gardens and orchards need it most. We must manage to save the water that falls during the five months when plants need it the least.



Here we have a scene in an orange packing house. The oranges are brought here from the orchards. They are sorted by machinery, packed in boxes by the people you see, and then put in a refrigerator car standing on the railroad track that has been built to the packing house.

Because we have let so much water run away to the ocean, we have already had to go outside our land for more water. The people of the city of Los Angeles need a great deal of water. The city spreads over many miles of country. It is growing larger every day. The Los Angeles River has water enough for a small city, but not for a large one.

Far to the north of Southern California there is a high mountain range. This range is called the Sierra Nevada. At the eastern foot of this range there is a long narrow valley called Owens Valley. The river that flows into this valley from the mountains has been brought to our great city. It is carried in a huge cement pipe. This pipe or aqueduct crosses the Mohave desert and two mountain ranges.

By and by this aqueduct will not bring enough water for our city and for the country around it. What can be done? In the first place we must let none of the water that falls on our mountains escape to the ocean. But how can we stop it? We must build dams in every mountain canyon. The water of the mountain rains and snows will collect behind these dams. It will form reservoirs or lakes. We can draw this water out in summer as we need it.

But when we have saved all the water of the mountains there may not be enough. Far away toward the east there is another great river. It starts in another great range of mountains. We call these mountains the Rocky Mountains. Those children who came from the East crossed these mountains.



Wherever our mountains rise a mile or more above the ocean you will find pine forests. This forest is on the top of Palomar Mountain, north of San Diego. The trees are yellow pines. Do they look thrifty? Is it winter or summer? Lower down on the mountain slopes you will find the elfin forest. Why does it not grow here?

The river flows down through a deep canyon. Then it crosses a desert. The water of this river has turned the desert into the blooming garden that we call Imperial Valley. From this valley we get our winter lettuce, spring melons, and in the fall delicious dates.

Our Southern California home will by and by get a part of the water of this river. Then more people can make their homes in this pleasant land.

Did you ever wonder what makes the light in the little glass bulbs that are in all our homes? There are more thousands of them than you can count. This light comes from electricity. Nature makes it in the thunder clouds. People make it when they draw a rubber comb through their hair on a dry day.

There are many ways in which we can make the electricity that lights our houses and does all kinds of work for us. The way that costs us least is to get water to do it. Where there are rapids or waterfalls in a stream we build a *power plant*. In this power plant the force of the falling water turns a sort of water wheel. This makes machinery go. The machinery makes electricity. Copper wires carry the electricity hundreds of miles to the places where we want to use it.

Nature does not send our land rain enough to make many large streams. In summer they are all small. Because of this we have to go to other mountain streams for water power. There the power of the larger streams makes more electricity. I am sure

you have all seen the power lines. Tall iron frames carry the wires across the country.

Nature gave our land enough water and electric power for a few people. But she made it so lovely that more people came than she expected.

SUGGESTIONS TO THE TEACHER

Run a stream of water from a hose down a grassy bank and then down one of bare earth. Have the children explain what takes place.

Model the basin of some river or creek with which the children are familiar. Explain to them the meaning of *basin*. Put a dam across the narrow valley or canyon of the upper part of the stream, so as to show how a lake or reservoir would be formed.

Model roughly the country through which the Los Angeles aqueduct is carried. Show the Sierra Nevada Mountains running north and south and bending around toward Tehachapi. Put in the Inyo-White Mountain Range almost as high as the Sierras. The long hollow between them is Owens Valley. Place the Mohave Desert on the south of the Sierra. South of the desert is a range of mountains running east and west, and south of this is another range. This latter range is the western part of the San Gabriel Range. Then show the San Fernando Valley. Tunnels carry the aqueduct through these two last ranges.

In every class there are children from the East. Let them tell for the benefit of the others the foods that are produced where they come from. Compare with our land.

THINGS TO DO AND TALK ABOUT

Tell about the shelters, clothing, and food of the Indians that lived here when white people came. In the deserts to the east of our land are Indians who live in stone houses and cultivate the

ground. They make clay dishes that we call pottery. Can you tell how these dishes are made.

The Indians who live in the North wear more clothing than our Indians did. Why was this?

Do you think that if our Indians could come back they would now feel happy in their homeland? What would they miss?

There are Indians still living in some parts of our mountains and on the deserts. Why do we find them where there are few white people? These Indians are on government land called *reservations*. What do you suppose they do for a living?

We enjoy many things that our grandfathers never thought of. Tell about a number of these things.

Tell what things you think we must have that our land does not supply.

Could you get along and be healthy and strong if there were such a high wall around our land that no one could cross it?

Could we find as much work as we now have to do if we were shut away from other people?

Which do you think we need the most—iron, copper, or wood?

NEW OR UNUSUAL WORDS

content	supply	trinket	tallow	abundant
	asbestos	machinery	expect	

CHAPTER IX

WHY MANY VILLAGES SPRANG UP IN OUR HOMELAND AND WHY SOME OF THEM BECAME CITIES

IF YOU HAD SOMETHING to sell what kind of a place would you pick out for your stand or store?

Men who want to sell drugs, or groceries, or fruit, or gasoline for automobiles choose their places of business with care. Can you tell why they seek the corner of a block where two streets cross?

A country merchant builds his store where two or more roads meet. Such a place we call a *crossroads*. A large valley with rich soil, water, and sunshine is a good place for a store. Can you tell why?

A place where two railroads cross each other is a good place for a hotel. A harbor or bay where many ships come is a good place for trading with sailors. It is also a good place for trading with travelers. Can you tell why this is?

Villages grow up at the crossing of good roads on which many people travel. The village at the best crossroads will become a city. The city that has the most business will become the largest. Tell us about any city in which you have been. Is it a good crossroads? If it is not a good crossroads there must be some other reason for its growing.

Buying and selling is only one of the things that make villages grow to be cities. Many travelers

change cars where railroads cross. They must have places to stay and get something to eat. Because of this, hotels must be built. Stores and schools and churches will follow.

A village that is a good place for a factory may become a city. A village that has a fine bathing beach, or hot mineral springs, or beautiful scenery, or fine climate may grow to be a city.

A mountain store may become the center of a village if it is in a place where people go to spend the



Have you ever visited Santa Monica and seen the cliffs? The waves once beat against them, but the land rose a little, leaving a sandy beach. What uses are made of this beach? In the back of the picture are the Santa Monica Mountains. There is a pretty roadway all along the foot of these mountains.

summer. A rich gold or silver mine, far away in the mountains, may make a city. A city where fruit and vegetables are abundant attracts people. Good schools attract people.

A place where there is much work to be done attracts people. If there are many kinds of work it will attract many kinds of people. A city has more kinds of work than a village. Because of this it will draw people who have learned to do many kinds of things.

It was not very long ago that the city of Los Angeles was a little village. There were then very few white people in our land. You could travel all day and not see a house.

People came slowly at first. It was hard to get here. The people of the East did not know what a wonderful land ours is.

As more people came, more places to trade were needed. Stores were built at crossroads. If many people made their homes near the store a postoffice was started. Then came a school. Before one knew it there was a village.

Some of the villages were in poor places for trade. Few people made their homes in such villages. Many villages had good places. They have become towns, and some of them have become small cities. Other villages had very good places. The village of Los Angeles had the best place of all. It has grown to be the largest city.

We shall learn more about Los Angeles by and by.

Let us now look at some of the other villages. We want to find out why they grew more slowly than Los Angeles. There are some that have grown very little.

The village of San Diego has become a large city. Nature made San Diego Bay the best crossroads for ocean and land travel on all our coast. But she put mountains behind it. This made it hard to reach by land.

Nature gave San Diego a mild, pleasant climate that everyone enjoys. But she is very stingy about rain. She left the country around the bay dry and desertlike. It was because there was so little water that the padres built the mission some miles up the San Diego River Valley.

But how strange Nature is! The mountains that she put in the way of travel are so high that much rain falls on their slopes. Great reservoirs have now been built to hold the rain water. This water has been brought in pipes to San Diego Bay. The dry slopes have been turned into gardens and parks.

We are glad that the mountains are where they are. They bring the rains that supply water for the lowlands. Roads have now been made across the mountains. But without the mountains there would be little water. Without water there would be no city of San Diego.

Perhaps some in the class have been at the San Luis Rey Mission. They may tell where it is and how they reached it. Many Indians once lived about this mission. The San Luis Rey Valley is large. There is

plenty of water. The soil is rich. The climate is good. Can you tell why it is that there are now hardly enough people to make a village? Is this a good or a poor crossroads place?

Mission San Juan Capistrano is in a pretty country. Who can tell on what highway it is and how it is reached? The mission is not far from the ocean. The soil is fertile and there is plenty of water. Can you tell why there is only a little village there? Is this a good or a poor crossroads place?

Let some one in the class tell about the city of Santa Ana. Tell where it is. Tell what river flows near by.. Why is this river dry most of the time? Tell about the beautiful broad valley around the



Magnolia Avenue, one of the beautiful drives near Riverside.



The entrance to Los Angeles Harbor. The great breakwater that protects the entrance is not farther in the ocean. This was once a shallow inlet with little water at low tide. Machines called dredges dug the mud out and made the inlet large and deep. You can see the branch on the right that leads to Long Beach. Mention the different things you can see in the picture.

city. Why is the soil so fertile? Why is Santa Ana a good crossroads city? Tell about the different places that you can reach from Santa Ana. Why is Santa Ana a good place in which to have a home?

I am sure some in the class can tell us about the city of San Bernardino. Once it was a little village where lived some Mormons from Utah. They had fertile soil and plenty of water. They were hard-working people. But these things did not make the village grow to be a city. We must look for some other reason.

San Bernardino lies in a great valley. There are miles of orange orchards all about it. On the north are lofty mountains. How pleasant they are on hot summer days! None of these things made the city.

San Bernardino has another name. This name tells us what we are after. This name is "The Gate City."

San Bernardino is a crossroads city. It is at the meeting point of two highways. Each highway leads through a gate or pass in the mountains. Through these gates come thousands of visitors and tourists from the far-away East.

Long Beach is one of the three largest cities of our land. You all know where Long Beach is. You know why the place was given the name it has. Nature left no harbor here. The place is not a crossroads. But the ocean beach was miles long. The beach is delightful on a warm summer day. Besides this there is the street of amusements to be visited after the bath.

After a time oil wells were drilled on Signal Hill. This oil field is now one of the greatest in the world. The business of oil wells made rapid city growth.

There are marsh lands between Long Beach and San Pedro Harbor. These were dug out so that boats could reach the city from San Pedro. Then a new channel was cut through the sand to the ocean. Commerce and manufacturing will make the city grow still larger.

Nature did little for San Pedro. But men have done a great deal. The little inlet of which we have learned was made deep and large. Great steamers now enter it. A long breakwater has been built across the outer harbor. Behind this breakwater ships now may anchor and be safe from storm.

San Pedro is now one of the greatest fishing ports in the world. It ships more oil than any other port. It receives more lumber than any other port. Why do we call San Pedro "the Gate of Los Angeles"?

Why did Santa Monica grow up where it is? There is a bend in the coast at this place that we call a bay. But it is open to the storm winds and waves. Santa Monica is not a crossroads city.

We shall find the reason for Santa Monica if we visit the beach that lies in front of the city. Back of the beach are the Palisade Cliffs. On the north are beautiful mountains. Pretty hills stretch along the foot of the mountains to Hollywood. On these hills is the State University. In Mandeville Canyon there is to be a great sub-tropical garden.

Pasadena, Santa Barbara, Riverside, and Redlands are not very large cities. Perhaps they will be large sometime. But people all over our country have heard about them. Is this because they are good crossroad cities? Is it because they manufacture goods? Or is it because they are such pleasant places in which to live? Let us see in what ways they are alike and in what ways unlike.



The winter winds blow fiercely over the top or crest of the Sierra Nevada Mountains. These mountains lie to the north of the land of which we are learning. But they are interesting to us because the melting snow on the slope we see in the picture supplies a part of the water for the city of Los Angeles. This picture looks almost like winter and yet it is about the first of July. That is, it is early summer. Do the trees succeed in growing to the top of the mountains?



The beach at Santa Barbara is a delightful place to bathe. The picture shows the Cabrillo pavilion. Back of the pavilion you can see the low hills on which the city is built. Far back are the high and steep mountains which are the Santa Ynez range, and which the winter winds sweep across.

We have learned that long ago the San Gabriel Mission was rich in cattle, sheep, and horses. The country around it is dotted with oak trees. The soil is good and there is plenty of water. The steep San Gabriel Mountains rise on the north.

But no city has grown up at San Gabriel. A little to the west is the city that has taken its place. This city is Pasadena. It has the same kind of soil, water, and oak trees. It has the same beautiful mountains and pleasant climate. It is a better crossroads and is nearer Los Angeles than San Gabriel.

We call Pasadena the "Crown City" because it has so many advantages. From Pasadena you can visit Mount Lowe and Mount Wilson. The mountains are so steep that when you are on the summit you seem almost over the city. Because of the beauty of the city, its parks, its playgrounds, its climate, and its nearness to Los Angeles, tourists like to live in Pasadena.

Why do tourists come from all parts of our country to stay awhile in Santa Barbara? There must be a reason for this.

Santa Barbara is a poor crossroads city. This is because of the high mountain range behind. The range cuts off the city from the rest of California. The railroad and the Camino Real or highway go around the end of the mountain range to reach Santa Barbara.

On the other side of the city from the mountains is the ocean. There is a good bathing beach. Far out

one can see the Channel Islands. But the city has little trade.

Santa Barbara is on pretty rolling hills between the mountains and the ocean. The mountains break the cool winds of winter. The mountains also give the city its water. The islands make the water



The Sweetwater Reservoir near San Diego. The water of a mountain stream is held behind the strong cement dam. If it were not for the dam the winter rains that gather in the stream would flow away to the ocean and do no good. Now the water is allowed to flow away as it is needed. Look at the picture carefully and you will see that the dam is built in a narrow part of the valley. This makes the dam stronger and it is less work to build.

warmer. They also break the force of the southwest storms. These are the reasons tourists like to go to Santa Barbara in both winter and summer.

People everywhere know of Riverside and Redlands because of their orange groves. The oranges are very sweet because the summers are warm and the sun shines brightly. We think of Riverside when we see and taste a navel orange. You cannot find anywhere a prettier country.

We might call Glendale a Little Los Angeles because it has grown so fast. Glendale is upon a pretty slope at the foot of the Verdugo Mountains. Roads lead away from it in every direction. The road to Pasadena by way of La Crescenta and La Canyada is very beautiful.

Hollywood is a part of Los Angeles. You all know how prettily it lies at the foot of the Santa Monica Mountains. Can you tell why it is almost frostless? You all know for what Hollywood is most noted.

SUGGESTIONS TO THE TEACHER

The children should be asked to think about and discuss the advantages and disadvantages of the city and town in which they live or which is situated nearby.

Each school district has a different physical environment. In each there is a different cultural environment.

Model in sand or clay those cities and their environments with which the children are familiar.

Do not dwell upon any of the situations which a majority of the children are incapable of visualizing.

Get them to talk about those things that are open to their own observation. When these are understood, the environments of other places, though they have not been seen, can be appreciated to a considerable degree. A model, for example, of the physical environment of Santa Barbara is very instructive and can be easily grasped though it is unfamiliar to the children.

Get the children to see how the situation of a place determines the kind of industries that are carried on and the trade that passes through or centers there.

Take some crossroad where there is only a store, postoffice, and school and compare it with one where a town or city has grown up. Ask the children to give the reasons for the differences as far as they are able.

NEW OR UNUSUAL WORDS

northeast attract strangely delightful channel

CHAPTER X

WHY THE VILLAGE OF LOS ANGELES BECAME THE LARGEST CITY IN OUR HOMELAND

WE HAVE NOW TRAVELED all over our homeland. We have visited many of the cities. We have seen how these began as villages. We have seen villages and towns that have not yet grown to cities. Do you think some of these will become cities by and by?

The country is the best place for a home. Tell all the good things a country home should have. But many people make their homes in cities. What is the reason for this? Are they lonesome in the country and want to be among other people? Do they want the good and the bad things the city offers? Do they live there because their work is there? Or is there some other reason? People, if they wish, can now live in the country and work in the city. Explain how they can do this.

Which city that we have talked about do you think will become the largest? San Diego and Long Beach are now about the same size. Tell all the good things you can about each. What has made San Bernardino a larger city than Redlands or Riverside? Which of the cities we have talked about is the best crossroads? In which are there the most kinds of work to be done? To which do people go for health and pleasure? In which would you rather live?

Tell all the good things you can about some village or town that you know. Do you think it will ever become a city? There are many things for you to think about before you answer this question.

We have left the city of Los Angeles until the last. It has grown so fast that the *Magic City* is a good name for it. Let us go up in our balloon again. Perhaps we can find out why it has become the largest city in all California.

We will go up a mile in the air. We can see most of the cities we have talked about. San Diego and Santa Barbara are too far away. On one side we can see the ocean. The island of Catalina is very clear. Far out we can just see the island of San Clemente. On the other side is the rim of mountains. This is the farthest land we can see. We shall soon learn about the wonderful deserts that lie beyond it.

We can see many valleys with hills and mountains between them. Where the roads are straight we know the land is flat. Where the roads wind in and out we know that the land is hilly and rough. Roads, you know, go around hills when they can.

From the balloon our homeland seems like a little world. The ocean and the mountains, with the deserts beyond them, shut it off from the rest of the great world. The great city below us is the center of this little world.

Los Angeles has grown up where Nature made everything ready for a great city. Every valley and every nook of our land seems to open to Los Angeles.



Street scene in Los Angeles.

Here is the meeting place of roads that come from the south, of roads that come from the north, of roads that come from the east, of roads that come from the west, and of roads that come from the wharves at San Pedro.

Los Angeles is like the hub at the center of a great wheel. The roads that meet there are the spokes of the wheel. Nature left an easy way from Los Angeles to any place you would like to go. There are gateways through the rim of mountains. These gateways are called *mountain passes*. Our harbors are the gateways into our land from the ocean.

How strangely the hills and valleys lie. If you want to go from San Diego to Santa Barbara, Nature's best road is by way of Los Angeles. If you want to go from San Bernardino to Santa Monica you go by way of Los Angeles. If you want to go from Long Beach to San Fernando you go by Los Angeles. If you want to go from Redlands or Riverside to Ventura you go by Los Angeles.

Pretend that you are a tourist wanting to see Southern California. First you would buy a ticket to Los Angeles. On getting there you would go to a hotel. Then you could take day excursions to any part of our land.

Now pretend that you live in Southern California, any place outside of Los Angeles. You want to visit some far-away part of the world. You would first go to Los Angeles. There you could buy a ticket to go by railroad, steamer, or stage to any place you wish.

Is there any other place in our homeland where so many people meet and pass as in Los Angeles? Nature placed the mountains and valleys where they are. When white people came they built roads where the slopes of the land made it the easiest. In some places the mountains were very much in the way. To make travel to Los Angeles easier men cut tunnels through these mountains. Do you know of any of these tunnels?

A part of Los Angeles lies on hills. Some of these hills are in the way of streets. Tunnels have been made through them. These tunnels make it easier to



A beautiful home on the Palos Verdes Hills. At the left you can see the ocean. Near it is Redondo. Far away you can just see the Santa Monica Mountains. Can you name any of the flowers that border the walk? What time of the year do you think this picture was taken?

go from one part of the city to another. Can you tell where some of these tunnels are?

Nature placed the best harbor of our land far away from Los Angeles. You all know the name of this harbor. She left a small, shallow one at San Pedro. But our city must have a safe one in which large ships may load and unload their freight and passengers. Men have now built a great breakwater to make the ships safe from storms. They have also deepened Nature's little inlet or harbor. The largest ships can enter the inner harbor.

Los Angeles is a good place for buying and selling all kinds of produce and goods. Suppose you kept a country store. Why would you go to this city with your produce? Why would you go there for the goods you wanted?

Products of every part of the world come to Los Angeles. There are many land highways. But the ocean highway is the best of all. The things that the people of the city make, and those that the people of the country around the city grow, can be sent wherever they are wanted.

Good highways help tell us why there are so many factories in Los Angeles. They tell us why there are so many gardens and orchards in the country around the city.

The pleasant, healthful climate of our city brings many people here. There must be hotels and lodging houses to take care of them. There must be many car lines and automobiles to carry them about. There

must be stores of every kind, groceries, fruit stands, and amusement places.

In a city each man has his own business. He knows one thing well. By doing that thing he earns money with which to buy what he needs. These needs are of many kinds. Each need is supplied by a different man. In this way city people all help one another. Each works for all as well as for himself. The people of our city are like bees in a hive. One cannot be comfortable and happy unless the others are. These things show us why our city is growing so fast.

In the country life is quite unlike life in the city.



The new Los Angeles Public Library.

In the country each family depends upon itself for most of the things it needs. Tell all you can of how the work of the country mother is different from that of the city mother. The farmer must be able to do many kinds of work.

More people are coming to Los Angeles every year. Some come for pleasure. Some come for their health. Some come to work in offices. Some come to teach school. Some come to work with their hands.

Los Angeles has already spread over many miles. From our balloon we can hardly see the end of the city. We can hardly tell where Los Angeles stops and other cities begin.

Perhaps our homeland will some day become one great city. How would you like that? Do you like a home in a city where people have to live close together? Or would you like best to live in the open country where there is plenty of room?

SUGGESTIONS TO THE TEACHER

Model again that part of Southern California adjacent to Los Angeles. Discuss with the children the following topics. Others may occur to you:

1. The water supply of Los Angeles. Show its natural watershed. Why the water from this watershed became insufficient. Where extra water has been obtained. Where it is planned to get more water.
2. Discuss the moderate temperature due to the fact that the city is a few miles from the ocean, but not far enough to make it very hot in summer.

3. Discuss the rainfall in the valleys about Los Angeles. Why is it much less than on the mountains to the north?

4. How would a high mountain range between the city and Santa Monica affect its climate?

5. The Pacific Electric relief map shows graphically how the various valleys about the city open to it. Use this map as an aid in perfecting the sand model, but do not put it up before the children.

6. Discuss Hollywood. Why is it one of the most pleasant parts of the city for a home?

7. Are the hills and mountains around Los Angeles useful to the city or are they only in the way?

8. Why is Los Angeles and the region around so loved by all its visitors?

9. Why ought Los Angeles become a great manufacturing city?

- (a) Pleasant, healthful climate in which to work.
- (b) Easy of access by railroad and automobile.
- (c) Fine artificial harbor.
- (d) The variety of raw products grown in the region about.
- (e) The great variety of food at a moderate cost.
- (f) Abundance of cheap fuel and electric power.

10. Compare the advantages of Los Angeles with the other cities of Southern California. Sum up the good points of each and see how they stand.

11. Does the climate and situation of Los Angeles offer any disadvantages? If so, get the children to discuss them. Are these disadvantages or drawbacks of such a nature that men can remove them?

12. Discuss with the children what will be done for fresh fruits and vegetables when all the land within many miles of

Los Angeles will be so thickly inhabited that there will be little room for gardens and orchards. Where will we then have to go for these foods?

13. Discuss with the children why Los Angeles is becoming such an important center for air navigation.

NEW OR UNUSUAL WORDS

travel	explain	hub	excursion	tunnel
	produce	different		

CHAPTER XI

THE FIRST AMERICANS WHO CAME TO SOUTHERN CALIFORNIA THOUGHT IT A POOR, DRY COUNTRY

WE OUGHT really to think of the Indians as the first Americans. No one knows how long they have lived here.

The first white people were Spaniards or Mexicans. Some of them came from Spain by way of Mexico. Some were born in Mexico and because of this were called Mexicans.

We call a citizen of the United States an American.

The Indians were happy here. They had everything they wanted. The Spanish settlers liked their new home because it was much like Mexico or their old home in Spain. But our grandfathers came from a land unlike either of these lands. They did not at first understand Nature's ways in California.

Our grandfathers reached this land in summer. How they enjoyed the fruit of the mission gardens. Their journey had been a long one across deserts and over mountains. But how dreary seemed to them the valleys of Southern California! The missions were little oases or fertile spots. Outside the mission gardens everything looked dry and dead. Our grandfathers were not used to irrigation and thought nothing would grow in the dry, sandy soil.

Besides they were not looking for places in which to make homes and become farmers and herdsmen. They had heard stories of gold, and that was what they were hunting. So most of them went on to Northern California.

In your automobile rides you have seen here and there bits of wild land. How barren they look just as Nature left them, with only bushes for covering! These bits of wild land look just as the most of our valley land did when our grandfathers came. Do you wonder that they thought this a poor place for a home? They thought little of the wonderful mountains that we love to look at.

Some of you children have lived in the East. Those



The strangest animal of our dry slopes is the horned toad. He looks like a fighter, but really he is very gentle. What use do you think the spines are to him?

who have may tell those who have not been there how that far-away land looks. They may tell about the grass being green all summer. They may tell about the rains and the thunderstorms. They may tell about the forests of great trees that Nature planted. They may tell why most of the houses are built of wood. They may tell why the houses are covered with wooden shingles instead of tiles.

Let us make a picture in our minds of this, our homeland, as it was long ago. Forget for a few moments all that people have done here. Forget the miles of shade trees, orchards, gardens, and green alfalfa fields. Forget the irrigating ditches, the roads, and the houses. Think of the valleys just as Mother Nature made them. Then think of driving slowly across these valleys with horses or oxen on a hot summer day.

You become thirsty quickly in the hot, dry air. You cross rivers of sand, but there is no water flowing in them. The springs are many miles apart. Here and there near the sandy rivers are sycamore trees and oak trees. These trees will grow only where there is water. They know where to send their roots for it.

The earth is dry and parched. You hardly see how the bushes can live. They seem dry and without life. You did not know that the summer was their resting time. They have gone to sleep as plants in cold countries do in winter. Nature has fitted them to live through the dry summer without water. She

does not start them growing until after the winter rains come.

You can tell the sagebrush by the smell of the leaves. You can tell the manzanita by its red bark and clusters of berries. You can tell the scrub oak by its small acorns. You will be sure to know the cactus. Its sharp thorns will remind you of what it is. The cactus is a real desert plant. Its thorns are weapons against those who seek to get the sap or water which it holds.

Your team of horses or oxen creeps slowly along. Lizards with long tails dart into their hiding places. Horned toads run quickly out of the way. A road runner seems almost to fly across the road. A rattlesnake may sound a warning from under a bush.

Perhaps you will frighten a mocking bird out of a leafy shelter where it is hiding from the hot sun. There are many animals and birds in this country, but you will see few of them. They come out of their hiding places in the early morning when the air is cool.

Do you wonder that this land did not seem home-like to the first people who came here from the East? They did not know that a few feet underneath the rivers of sand there was plenty of water. This is Nature's way of saving the water. If the water had to flow on the top of the sand the dry air would soon drink it all up.

You would see a different sight if you followed the sand river back to the mountains. There you would

forget all about the dry valleys. The mountain canyons are deep and shady. There is plenty of water. It dashes from rock to rock. It splashes over ferns and flowers. You may see trout in the still pools. You will hear the songs of many birds.

But that was very different from the way our valleys looked in summer, long ago. How did they look in the fall? At this time of the year the days are not so hot. The sun does not travel so high in the sky. The water begins to creep up through the sand. It begins to form little pools where in summer there was the dry river bed.



This is the San Gabriel River in summer as it starts across the valley to join the ocean. This river is much like the Santa Ana River after it has become tired carrying its load of boulders, as shown in the picture on page 213. Why do you think this is a picture of the river in summer? If we followed it we would soon come to where there was no water, only sand. You have learned what becomes of the water.

But the seeds in the ground, the bushes and the trees stay asleep until the rains come. It must rain in this land sometime or there would be no living things. Winter comes, but it is not cold. Sometimes Jack Frost nips the tender plants, but most of them do not fear him.

At last the south wind begins to blow. Clouds, coming from the ocean, sweep over the valleys. They cover the whole sky. The welcome rain begins to



Many little streams unite to make the river that flows down through the shady canyon. It is on its way to the open valley. There it is no longer shaded and so creeps down and hides in the sandy bed. Note the great rocks it has brought down. They are also on their way to the valley. Here you see they are sharp and angular. By and by, as shown on page 213, they will have been worn smooth and round.

fall. Soon everything looks refreshed. But the seeds do not sprout yet. The plants do not wake up and send out new leaves. They are waiting for the warm sun to come back.

The spring is here at last. Every day the sun climbs higher in the sky. Green grass springs up where we thought nothing would grow. The pussy willows come out. The trees put on bright, new leaves. What a sight the wild flowers make! They are everywhere. They are of many kinds and colors. They are brightest and most beautiful in the soil that you thought so poor. This soil is really not poor. It will grow anything. All that is needed is water and warm sunshine.

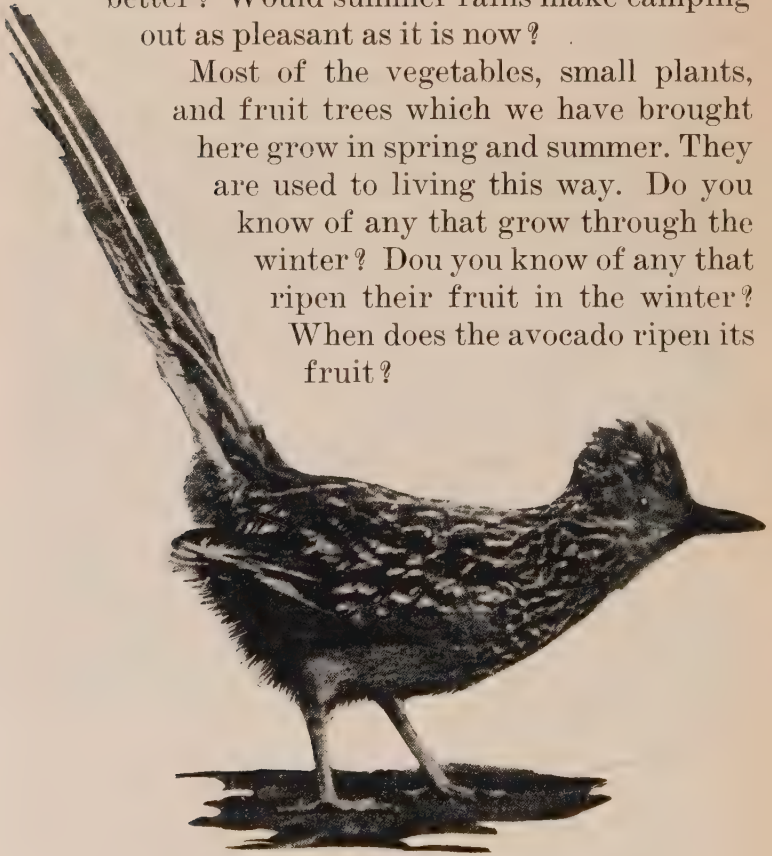
In the summer the birds looked tired and dusty. We saw only a few. Now there are many different kinds. Each kind has its own plumage and song. Their music fills the air. We love the mocking bird most. He is an early riser. He begins his song two or three hours before daylight. He is as happy as we are that he lives in such a land.

If it had been spring when our grandfathers first saw this land they would not have thought it so dry and barren. It is really not barren. Some parts have a great deal of rain. It is not like most other lands. We have to become used to Nature's way of doing things here. Nature has been many years getting the plants and animals used to the long dry summers. The many kinds of wild plants that our grandfathers found here tell us of her work. These

plants are as happy in the dry summers as other plants are where the summers are wet.

We think Nature might have done better by sending rains in the summer. She might have made the winters dry. Which way do you think the plants would have liked better? Which way would you like better? Would summer rains make camping out as pleasant as it is now?

Most of the vegetables, small plants, and fruit trees which we have brought here grow in spring and summer. They are used to living this way. Do you know of any that grow through the winter? Do you know of any that ripen their fruit in the winter? When does the avocado ripen its fruit?



The road runner makes its home in our dry valleys.



These are the very steep and rocky slopes of the high mountains at the head of the San Gabriel River. Far down in the canyon at the left of the picture there will be, by and by, a great lake or reservoir formed by the San Gabriel Dam. Note the trees growing upon the almost bare rocks at the right hand of the picture.

All our cultivated plants must have water in the summer. We cannot make Nature bring summer rains. But we can save the water of the winter rains. Then we can supply the plants whenever they want it. We have made reservoirs to hold a part of it. Nature stores a part in her own reservoirs underground. We can get this water by digging wells. In some places the water flows out of these wells. We call such wells artesian wells. The children who live near Santa Ana and in Coachella Valley can tell us about such wells. Sometimes the water does not rise to the top of the ground. Then we have to

pump it. Do you know what power we use to pump water?

In the land from which our grandfathers came people think Nature's way of watering plants is better. We think irrigation is better. Can you tell why irrigation is better? Ask some of the children who have lived in the East if the rains always come when the gardens need water. What sometimes happens to gardens in the East?

Call up the picture of our land as it was when your grandfathers first saw it. How different it looks now. Would you need to go thirsty if you drove over it now? Water and hard work have done wonders. Nature got everything ready. She put here all the things we need. We are trying to make the best use of them. In this way we are unlike the Indians.

THINGS TO DO AND TALK ABOUT

Let us think of the four seasons—spring, summer, fall, winter.

1. Which one do you like best? Give your reasons.
2. In which do we get most of the rains? Is this a cold or a warm season?
3. Mention some trees that grow through the winter and some fruits that ripen in winter.
4. If it rained in the summer would this be the resting time of the wild plants?
5. Tell about some visit to the mountains in summer. Did you find the wild plants growing or resting? Did you find flowers in bloom? There are two things that make mountain

plants grow in the summer as they do in the Eastern states. One is that there are thunderstorms in summer. The other is that the winter and early spring are too cold.

6. Mention some fruits that ripen in the spring.

7. Mention some fruits that ripen in summer.

8. Mention some fruits that ripen in the fall.

9. How is it that there are oranges in our markets throughout the whole year?

Let us now think of our land as made up of two kinds of slopes—mountain slopes and valley slopes. Then let us think of the rivers that flow down these slopes.

1. Upon which slope do the rivers rise?

2. Where do the rivers get their water in the summer?

3. What supplies most of the water in winter?

4. If you started at the summit of some mountain you would find that the rivulets unite to make creeks and the creeks unite to make rivers. Until the rivers leave the mountains they are growing larger.

5. When the river leaves the mountain it flows out upon the valley slope.

6. As the river crosses the valley slope it grows smaller. You have already learned the reason for this.

7. Before reaching the ocean it has disappeared. You have learned what becomes of it. Think of the sandy bed. Think of the dry warm air and the bright sunshine.

8. In other lands the rivers become larger until they reach a lake or ocean.

Tell as fully as you can why the early Spaniards at once felt at home in our land.

1. Think of the dry summers of their homeland, and the need for irrigation.

2. Think of the lack of trees in their homeland, and of what materials they had with which to build their home.

3. The fruits and seeds and grains they planted here came from their homeland. What does that tell us about the climate of that land?

Why did the first Americans from the East not feel at home? Think of the following topics:

1. They had to learn to take care of plants in a new way.
2. Many of the fruits that grew here were new to them.
3. They had to build their homes of materials that were new to them.
4. No rain fell here in summer. In their Eastern home there were showers quite often in the summer.

NEW OR UNUSUAL WORDS

understand bit frighten splash plumage

CHAPTER XII

HOW THE DRY VALLEYS BECAME FRUITFUL GARDENS

THE VILLAGE of Los Angeles took the place of the Indian village of Yang-na. It grew into a town, a city. Almost before we knew it the city became the largest in California.

The same magic change came over the dry valleys. The brush and bushes were dug out. The land was plowed. Water was brought. Gardens, orchards, and happy homes spread over them.

What sort of magic was this? Was it the magic of the Arabian Nights stories? Or was it the magic of hard-working and wide-awake people?

What did Nature do for our land? She placed deserts and mountains on one side. She spread the ocean on the other side. She put the fertile valleys between them. She made all sorts of slopes. Some of these slopes are gentle and have deep, rich soil. Others are steep and have poor, rocky soil. She gave one part a hot summer sun. She made another cool and foggy. To still another she gave real winters with cold winds and deep snows.

Nature placed minerals in the rocks of the mountains. She hid petroleum underneath the valleys. She clothed the slopes with many kinds of plants. She added birds, animals, and insects. She made the waters the home of fish.

Mother Nature gave all these things to the Indians. But the Indians were like children. They did not know how to use the most of them. All they thought of was something to eat, a little hut in which to sleep, and a few skins to wear when it was cold. The Indians used the gifts of Nature just as they found them. People who are traveling the road that leads to civilization try to make better and more useful the gifts of Nature.

Perhaps Nature got tired waiting. Anyway, white men came at last and took the land away from the Indians. It is too bad that sometimes they treated the Indians very unkindly. The white men ought to have thought of them as children who needed care.

The white men brought cattle of every kind. They brought fruits and grains and vegetables. They built missions or churches in the best places. Here and there a rancher or farmer built his home. You could tell a ranch house by the whitewashed walls and red tile roof. But most of the country looked just as it did when the Indians had it all to themselves.

For a long time there were few white people. There was plenty of room for the cattle. They needed little care. They wandered wherever they would. The Indians were made to do most of the work. Life was very pleasant. There was plenty of food. What was the use of working hard? It was a quiet, sleepy land under the rule of Mexico.

Then our grandfathers came from the East. Their

eyes were sharp. Their minds were bright. They enjoyed hard work. In a little while they learned Nature's ways in this land. They found out its riches.

California was once called "the land of gold." There are two parts to California. One is called Northern California. The other is called Southern California. It was in Northern California that most of the gold was found. The people who wanted to be miners went there. Have you ever been in a gold mine? Have you ever seen a miner wash grains of gold out of the sand of a creek bed? Have you ever



This is an old Spanish ranch house at Santa Barbara. The walls are made of adobe or clay. Plaster has been put on the outside to keep the rain out and make the house look better. With what is the roof covered? Why was adobe used instead of logs, as in the picture on page 309?

seen pieces of rock with grains of yellow gold in them?

Our Southern Land has little of this yellow gold. This is real gold. It is hard to get. Sometimes a miner works years before he finds it. Ask some miner that you know if this is true. Our grandfathers soon found that this land of ours had something better than gold. What do you think it was? It was good soil, water, warm sunshine, beautiful mountains and valleys, and a climate that was mild and healthful.

Nature put in this land everything needed for happy homes. The first people she brought here made no more use of it than the animals do. The Spaniards came next. But they did little with the land. Then the Americans came. They were ambitious and loved to do things. They started the magic working. Our fathers are carrying it on. You will soon be old enough to help them.

What are the first things that people think of when choosing places for homes in a new land? The thing they must have first is food to eat. The Spaniards brought animals, grains, fruits, and vegetables. Our grandfathers found them already growing when they came. All they had to do was to learn how to take care of them.

The next thing they had to think of was shelter from the sun, rain, and cold. The Spanish settlers showed them how to make bricks of clay or adobe. They showed them how to make roof tiles of clay,

and then burn them hard and red. They showed them how to plaster and whitewash the walls of clay bricks.

The next thing to be thought of was clothing. The Spanish ranchers had great herds of cattle and sheep. They tanned the skins of these animals and also those of deer. The leather thus made was quite soft. It was easily cut and made into clothing. Trading ships sometimes came. They brought woolen and cotton cloth for clothing.



In Spanish days nearly all the buildings were made of adobe bricks. These bricks are a mixture of straw and adobe or clay. Desert houses are often made of adobe now. Can you tell why adobe makes cooler and more comfortable houses in the desert than does wood? The picture shows a place where adobe bricks are made.

Water was another thing that must be thought of. Homes must be where water is easy to get. There were no iron pipes in which to carry it. But limestone was found and burned to make lime. With this some of the ditches were plastered. You know how quickly water is lost when carried in a ditch in sandy soil.

The Spanish settlers discovered that the fruits and vegetables of their homeland would grow in California. They brought a few from Mexico, for the Indians living there cultivated the soil. Among these last were corn, squashes, pumpkins, beans, and peppers.

Our grandfathers brought other seeds and plants from the East. Almost every year we get some new seed or plant. They are gathered from all parts of the world. Some come from parts that have a climate like our coast. Others come from hot lands with a climate like our deserts. Others come from cold lands.

How is it possible that plants from cold, from dry, from hot, and from wet lands will grow in California? Each plant must have its own climate. Ours is a magic land. Nature has given it almost every climate in the whole world. We shall learn how she did this by and by.

A few fruits from the hot lands will not grow here. The lands where these fruits grow never see Jack Frost. But he sometimes visits us in winter. You see some of the fruits that do not like the frost

in the markets. Tell what you can about them. Perhaps you know where they come from. Can you think of anything better to call our land than a "Garden of Eden"?

SUGGESTIONS TO THE TEACHER

Impress upon the children the value of the soil, and the importance of all industries that have to do with the soil.

Show them that the prosperity of their land depends largely upon the soil and upon the fruits, vegetables, grains, and nuts that it produces.

Show the children that—

1. All other occupations depend upon the farmer.
2. Miners sometimes come to the end of their veins of gold.
3. Oil wells will sometime pump out all the oil that is in the earth beneath us.
4. The forests will sometime be gone if we do not take care of them and see that the soil does not wash away.
5. Real food for the human race comes solely from soil that is moistened with water and heated by the sun.
6. Real food is always the product of living things—preferably plants.
7. Table salt and all other minerals are not the product of living things. They are not good for us, whether we take them as food or as medicine.
8. Our food plants are taking substances out of the soil. We must supply fertilizers to it if we would continue to have it productive.
9. The soil will last forever if we take care of it. Nature is making more soil all the time.

10. We can create new fruits and flowers as Burbank has done.

11. Men employed by the government are hunting all over the world for new fruits and vegetables. They often find new ones that it is hoped will do well in our climate.

12. Many kinds of climate make possible many kinds of food. This makes necessary many kinds of farming.

13. One of the reasons people of other lands are attracted to our land is because of the abundance of many kinds of products.

NEW OR UNUSUAL WORDS

civilization	whitewash	wander	healthful
ambitious	discover	climate	

CHAPTER XIII

WHY THE PEOPLE OF OUR LAND ONCE RAISED ONLY FOOD ENOUGH FOR THEMSELVES

WE HAVE LEARNED that there are many kinds of climate in our land. We have learned that it has great valleys of fertile soil. Because of these things it will grow almost everything. It will grow enough to feed nearly half the people of the whole United States. We are now sending delicious fruits all over the world. We could send much more if we could get people to eat them.

But there is hope for our fruit growers and gardeners. Every year people are learning to eat more fruit and vegetables. They are learning how well and strong such foods make them.

Once the people of cold lands ate very little fruit of the warm lands. They hardly knew how it tasted. In summer they had their own fruits and vegetables. In winter they had little fruit except apples. They had few vegetables besides potatoes.

This was because there were no good roads. There were no fast steamers. There were no railroads with refrigerator cars. The people living on one side of a mountain range might have plenty. The people on the other side might be starving. There was no way of getting fresh fruit and vegetables from hot lands to the people of cold lands.

Long ago there were few white people in our land. They ate little fruit and vegetables. Perhaps they did not like to work hard enough to grow them. In most hot lands there is plenty of rain. Fruit grows with little care in such lands. But although fruit is easily obtained in these lands, many of their people eat little besides the flesh of animals or fish.

When our grandfathers first came to California they lived mostly upon meat. There was much wild game and plenty of cattle. It was easier to get meat than to grow fruits and vegetables. Ours is a warm land. In some places it is hot. Meat is not a good diet in a warm land.

But after a time our grandfathers became wiser. They learned what Nature intended the people of our land to eat. She intended this land to be the garden of the world. They learned how easy it was to grow fruit and vegetables, but where could they find a market for what they did not need at home?

People in other lands were happy with what they had. They did not know how healthful our fruits and vegetables were. And so of course they did not want them. Besides this there was no way by which we could send our products cheaply and quickly.

Were the early settlers really lazy? Were they like the Indians? Let us think of our land when it had only a few people in it. Let us think of it as a bit of the world far away from the regions where other white people lived. Let us think of it as shut in by mountains and deserts and ocean. We might

think of it as an island which is far away from other lands.

Long ago there were no roads from Southern California to other lands. Ships came once in a while. But no one knew when to look for them. There was no telegraph. There was no wireless.

Suppose you lived in such a land. Would you do more than you had to do to get food, shelter, and clothing? The first white people were really not lazy. Nature took care of most of their needs.

The flocks and herds grew in numbers. The sheep



Tell what you can about a "round-up." This is a picture of our land when it was the home of countless thousands of range cattle. Can you tell what they were raised for? To what parts of our land would you have to go now to see a picture like this?

needed watching, but the other animals wandered free. There were bands of wild horses and donkeys. The cattle became wilder than the deer.

This is what someone wrote long ago about the wealth of the missions: "Their granaries were filled with grain. Their orchards were laden with oranges, plums, pears, citrons, lemons, apples, and figs. Their vineyards covered the hillsides, and the flocks and herds the plains."

But why did they raise so many cattle? There was no sale for meat. Cattle could not be shipped away by boat as we ship them now. The cows were too wild to be milked. There was use for only a few of the horses. The sheep and goats were more valuable. Sheep supplied wool. This could be woven into cloth. Goats were sometimes milked. Butter and cheese were made from the milk.

The hides and tallow were the only parts of the animals that could be sold. Trading vessels came to get the hides and tallow. Sometimes they took wool. These things would not spoil during the long voyage. They would always bring money for the ship owners at the home port. The trading vessels left in exchange many articles the settlers needed.

There was a little trade between different parts of our land. Roads led from Los Angeles to nearby ranches. Great carts with wooden wheels and drawn by oxen traveled these roads. You always knew when one was coming. The squeaking of the wheels could be heard long before the cart came into sight.

The first settlers of San Bernardino came from Utah. They brought cows and chickens with them. The springs and meadows made it a good place for dairying. But there were no fruit orchards.

These hard-working people took butter and cheese and eggs to Los Angeles. They carried back oranges, grapes, and other fruits. It took three days to make the trip each way. How long does it take you now in an automobile?

Perhaps you wonder why fruit could not be sold in San Francisco. There were two good reasons.



The festivals or fiestas of Spanish times were gay affairs. This is a street parade in Santa Barbara that pictures to us how they looked. Note the oxen, the yoke by which they pulled the cart with its clumsy wooden wheels. The driver is dressed in Spanish costume.

The first was that there were few people in San Francisco until the discovery of gold. Los Angeles was only a little village, but it was larger than San Francisco. The other reason was that there was no way of carrying fruit so far. The Camino Real was a rough road. Fruit would be spoiled before getting to San Francisco.

People all over the world heard of the discovery of gold in Northern California. They came by sailing vessels. They came by ox teams and horseback. There were thousands of them. Few of the gold-seekers came by way of Los Angeles. This village was not on the shortest route to the mines.

The people who came by water stopped at San Francisco. It was the point where the ships unloaded. It was the starting point for the mines. A city grew up in a few months. This is the time spoken of in the old rhyme:

“In the days of old,
In the days of gold,
In the days of '49.”

No one then thought of our Southern Land. Every one wanted to go to the mines. There gold was to be had for the digging. No one thought of growing fruit or vegetables or wheat. These foods became very scarce in San Francisco. What a market it would be for wheat and cattle! To be sure cattle could be driven to San Francisco. They would not need roads. Wheat might be carried to San Fran-

cisco by oxcart or muleback. It would take a long time and would it pay? Los Angeles had only one tiny flour mill run by water power. San Francisco had no mills at that time. Wheat might be carried by boat from San Pedro. But what use could the people of San Francisco make of the wheat without mills to grind it?

How hungry the thousands of miners in San Francisco were for bread! But they had to wait for ships to bring flour from New York. It took a sailing vessel half a year to make the voyage. It took ox teams almost as long.

Northern California filled with people hunting gold. They came from all parts of the world. No one then cared about Southern California.

In Northern California there was bustle and noise. In Southern California people lived quietly. What was the use of working any more than to get enough to eat? There was no market for produce. They had little to do, for Nature was good to them.

There was much spare time. What did the people do with themselves? The herds of cattle needed little attention. The work of growing grain, fruit, and vegetables was mostly done by the Indians.

It was not safe to go among the cattle afoot. There were few roads, but there were many horses. Because of these things everyone learned to ride horseback. Even little children were good riders. They took much pride in their saddles and bridles. These were beautifully made and adorned with silver.

There were many religious festivals. There were amusements such as dancing, cock fighting, gambling, horse racing, and bull fighting.

Few Americans had homes in our land at this time. When gold became hard to find many became farmers or stock-raisers. They could not sell much of their produce. But they could get enough to eat.

It was now the turn of Southern California to become the land of gold. But the gold of our land was not dug out of the earth. Ours was a different kind of gold. It grew on trees. It was the golden orange.

SUGGESTIONS TO THE TEACHER

The lesson to be learned from this chapter is the necessity of good transportation if a country is to develop.

Show what would be the condition of our land without good transportation.

Discuss the kinds of transportation we employ. Which is better for perishable articles—the railroad or water? Which is better for heavy articles that will keep?

Why we must have transportation that is cheap and rapid.

1. We grow many fruits and vegetables not grown in other parts of our country.
2. We produce fruits and vegetables earlier than do other parts.
3. There are many millions of people who live where the winters are long and cold.
4. These people are glad to get our products, provided we can deliver them at a reasonable price and in good condition.
5. Fruits, vegetables, and nuts are much more healthful than many of the foods people of the North eat during the winter.

6. Our fruit, vegetable, and nut growers can sell all they can grow if we can show the people of cold lands how good and healthful our products are.

7. We can ship fresh fruit and vegetable products during every month of the year.

8. We can produce any quantity wanted of dates, raisins, prunes, peaches, apricots, pears, and apples which, when dried, are healthful and easily kept.

Discuss the possibility of being able to ship our perishable products by aëroplane. Could this be done in winter when the air is very cold?

We buy some tropical fruits that we cannot grow.

We buy winter tomatoes from Mexico where they grow earlier in the spring than do ours because of the absence of frost.

NEW OR UNUSUAL WORDS

adorn	amusement	gamble	festival	supply
	bustle	valuable		

CHAPTER XIV

AS OUR LAND GREW OUR WORK CHANGED

WE WORK partly because we must. Work brings the money with which to buy the things we want. We work partly because we love to do things. We love to find out things about the world around us.

All of you were babies once. You were weak and had to be taken care of. You could do nothing for yourselves. You are now school children. You are old enough to do light work. When you are twenty years old you can do hard work. When you are forty years old you will be able to do many kinds of work. By that time you will have learned a great deal.

Countries are like people. Countries are born, they grow up, and then become old. When countries are very young the people who live in them do one kind of work. When they become older their people do other kinds of work.

Southern California is a young country. It is now growing very fast. The first people of California were Indians. They did little work, for Nature took care of them. They were like young children that never grew up.

The first white people were Spaniards. They brought animals, grains, fruits, vegetables, and nuts. They did some work, but Nature supplied the most of their needs. They were like older children.

Then the Americans came. At first they lived much as the Spaniards did. They raised cattle and enough fruit, grains, and vegetables for themselves. We have learned how far away from other people California was at that time. We have learned how hard it was to reach this land. It took four months to make the journey with ox wagons from the East. It took from four to six months by sailing vessel.

If you could have traveled over California at this time, what would you have seen? You would have seen the missions and the buildings about them. You would have seen a few villages and towns. You would have seen a few ranch buildings. About the missions and towns you would have seen fields of grain, orchards, and gardens. But most of the country was just as Nature made it.

I am sure that you would have noticed the cattle, sheep, and other animals. You would have said that the raising of cattle was the chief thing the people did.

The cattle ranches were not homelike. Some of them had no gardens or orchards. The food eaten was chiefly meat. There was no milk or butter.

These ranches were very large. It would have taken you all day to ride around some of them. There were no fences. Each ranch had its own branding iron. Once a year the calves were marked with this red-hot iron. In this way each rancher was able to know his own cattle.

Most of the farming tools needed were made by

hand. Trading ships brought many articles that could not be made in the homes. At the *rodeo* or branding time, and at the sheep-shearing time, there were festivals and games of every kind.

The ships carried away hides, tallow, and sometimes wool. Why do you think it was that little wheat was raised? Why was there none shipped away with the trading vessels? Would it be safe to sow wheat without having the fields fenced? Would it have been easy to get grain from the fields to the boats?



If you have traveled over the El Camino highway from Santa Barbara toward San Francisco you have seen a long high mountain range on your right hand. On the other side is the ocean. Somehow you have got to get by these mountains. How could it be done? At last you came to a gap in the mountains made by a creek. This is the Gaviota Pass, or gate.

This is the picture of Southern California as the home of cattle and sheep. It is the first part of the story of our magic land.

For a long time people in the East knew only one thing about California. They knew it was a land of gold. Then they began to hear about Southern California. But these stories were not about gold. They were about beautiful valleys where it was never cold and where the most delicious fruits grew.

It was a long voyage to California by sailing vessel. It was a long and dangerous journey with ox teams. But little by little people began to come. Some made their homes in Los Angeles. Some settled in other villages. Some got land in the beautiful valleys. Did you know that there are hundreds of such valleys in our land?

These home-makers learned irrigation from the Spaniards. They learned that many kinds of fruit thrive here. But there was no one to whom they could sell these fruits. They knew that people of the East would be very glad to get some of the fruit. But there was no way of sending the fruit to those who wanted it.

Men said that a railroad could not be built to California. There were broad deserts without water. There were high mountains and rivers to be crossed. But do you know that we can do anything we really want to do?

The first railroad from the East ended at Sacramento, our state capital. Then a railroad was built

from the East to Los Angeles. A stagecoach once ran between Los Angeles and San Francisco. Finally a railroad took its place.

Look toward the East from some high mountain near Los Angeles. Mount Lowe or Mount Wilson will do very well. You can see the two sentinel peaks of which you have heard. Some of you know the names of these peaks, I am sure.

Between these peaks is a low place or pass. In this pass is the town of Beaumont. Most of the cherries you see in the markets come from Beaumont. Have you ever been through this pass or gateway? It is the most wonderful one in California. The first railroad from the East chose this gateway as the easiest way to reach Los Angeles.

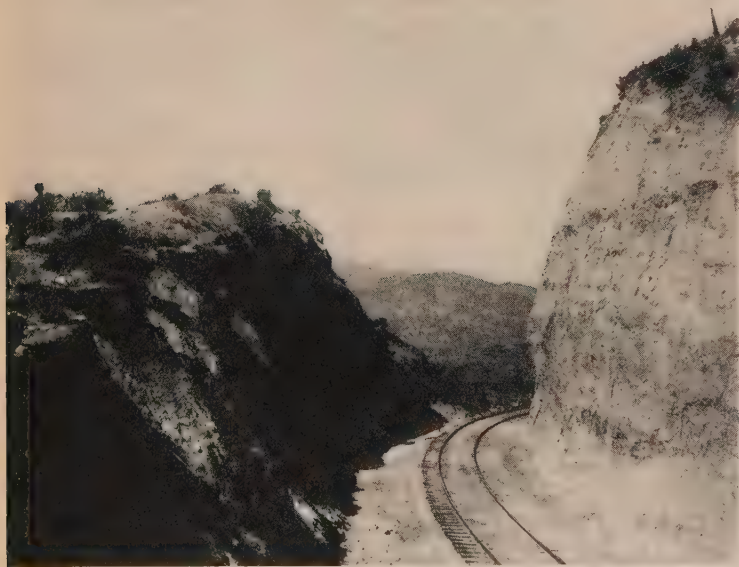
Before reaching the gateway the railroad had to cross a desert. This was once called the Colorado Desert. Now we call it by other names. One part is Coachella Valley. The other is Imperial Valley. There are now many wells and irrigating canals in these valleys. But when the railroad was built there was no water. All the water for the workmen had to be brought a long distance on water cars.

A part of the railroad from Los Angeles to San Francisco was very hard to build. It had to cross two mountain ranges between which there was a desert. After passing the mountains the railroad came to the San Joaquin Valley. You know how smooth and even this valley is for hundreds of miles. Will some one of you who has traveled to San

Francisco through the San Joaquin Valley tell what he saw?

What do you suppose happened after the railroad came? Farmers began to grow wheat. They could now send it to market in the East. There was another thing that helped them. More wagon roads were made. Grain could be hauled to the railroads or to harbors on the coast. More and bigger ships began to come for cargoes of grain. They no longer sought hides and tallow.

It was found that wheat would grow in most of



This is a picture of the Santa Fe Railroad where it crosses the Cajon Pass or gate. Compare this gate with the Soledad Gate shown on page 146. Which do you think is the easier gate to go through?

our valleys without irrigation. The spring rains watered it, and when the dry summer came it was ripe. Thus California became a great wheat land.

What do you think was done with the cattle and sheep when the valley lands were fenced and plowed and sowed to wheat? They were driven to the hills and mountains. Here there was better forage than in the valleys. There was also plenty of water and shade.

California now became the land of the grain farmer. There were fields of waving wheat as far as the eye could see. Barley and oats were also grown. Tell if you can what each of these grains is used for. Why was there a better market for wheat than for other grains? Little corn was grown at this time. Can you tell why this was? What care does corn need that wheat does not need?

If you had lived on a great wheat farm you would have been lonely. Homes were far apart. Often they had no water for irrigation. Because of this lack of water few of these homes had gardens and orchards. There was no milk or butter on most of the grain farms. In those days there were no dairymen to deliver the morning's milk. There were few fruit and vegetable peddlers. There was no ice to keep the food and drink cool.

More and more Eastern people learned about the land where it was always summer. More and more of them left their homes and made new ones in California. But these people did not want to be-

come grain farmers. They wanted to grow fruit and vegetables and have milk, butter, chickens, and eggs.

What now happened to the grain ranches? Many of these did not pay well because there were dry years when the crop was small. And so the owners of some of the ranches began to cut them up into small farms. This was just what the new people from the East wanted. A large ranch might make hundreds of little ones. Each little ranch could have its own home. Each home could have its garden and orchard. Each could have its cow and chickens. This is the end of the story of Southern California as the home of cattle, sheep, and grain ranches. It is the beginning of a more interesting story.

Grain farmers did not irrigate their fields. They sowed the grain in the fall or winter or early spring. The warm rains of spring made it grow very fast. The hot sun of June ripened it. Then it was ready to harvest.

But gardens and orchards must have water in the summer. Dams were made in near-by streams. The water was carried in canals to the places where it was wanted. Here it was divided into hundreds of little canals or ditches. By this means each garden and orchard got what it needed.

In many places it was easier to get water from wells. Nature herself stores underground a part of the rain that falls each winter. Windmills often pump water for cattle. Why were none used to pump water for irrigation? Most of the wells were once

pumped with gasoline engines. Now we more often use electricity.

Happy were those farmers who had wells from which the water would flow. Do you know what such wells are called? Between the city of Santa Ana and the ocean you will see many such wells.

Soon gardens and orchards, cows and chickens, gave the people of our land all the fresh food they wanted. More people wanted to come here. Business was so good that another railroad was built. The first railroad, you remember, came through a pass between the twin peaks. This pass is to the east of the city of San Bernardino. The second one came through a gap or pass in the mountains north of this city. Then after a time a third railroad came through



The Soledad Gate or pass is the easiest one to go through between Los Angeles and the Mohave Desert. See how broad and flat it is. The Southern Pacific Railroad uses it, as does also an automobile road.

this pass. Can you tell the names of these three railroads?

Every year more people came. Some made homes in the country. Others liked the cities better. Each year there were more people to be fed. But finally more fruit and vegetables were grown than could be eaten. Did you ever hear of a land that was so bountiful? What was to be done with the produce that was not needed at home.

We have fresh fruit and vegetables throughout the year. But people in many other parts of the world do not. Let us hear some stories from children who have lived in the East. Tell us about the long winters there. Tell us about winter sports. But do not forget to tell us how little fruit and vegetables you had. About half of the year is too cold for tender plants. Many that we have will not grow there even in summer.

This is the picture of our land as the home, first of cattle and sheep, then of great grain ranches, and, last of all, of little farms with comfortable homes. On these little farms grew fruit and vegetables of every kind. But, alas, there was no market for them. This picture is the third part of the story of our magic land. But there are more pictures to follow.

Finally someone thought—railroads connect us with the people of the East. Why could we not send them fruit and vegetables for their winter use? But could we do this? It would take a week for each train-load. By that time the softer ones would be spoiled.

Then someone thought again. This is what he thought: Ice keeps things from spoiling. We might make cars that carried ice enough to keep our products fresh. Steamers that came to our ports might also be supplied with ice. They could then carry our products to any part of the world. Now we have many thousands of refrigerator cars, and steamers with great refrigerator chambers or rooms.

Thus we were able to send fruit and vegetables to the people of the East. How they enjoy our lettuce, spinach, celery, early grapes, and cantaloupes! We now send them great quantities of oranges, lemons, figs, persimmons, pomegranates, avocados, and other good things. Steamers now take oranges, apples, lemons, grapes, and some vegetables to people living on the other shore of the ocean.

The fresh fruit, after being picked, is taken to the *packing house*. There it is neatly packed so that it will tempt people to buy. We now sell this fruit all over the world. When people have tasted it they want more.

But we have other ways of preparing fruit for people in far-away lands. Many kinds of fruit when dried will keep a long time. Among these are grapes, figs, prunes, peaches, apricots, pears, and apples.

Grapes dried in the sun make the best raisins. The air must be dry and the sun hot for them to dry well. Can you tell why we make few raisins in Southern California? Why do the most of our raisins come from the vineyards around Fresno? There is a little

valley between Los Angeles and San Diego where wonderful raisins are made. This valley has a high mountain between it and the ocean. Can you tell what this mountain has to do with the raisins being so good?

Other kinds of fruit are dried on trays in little buildings called *driers*. Hot air is passed over the fruit until most of the water is taken out of it. Where there is no danger of rain and the sun is hot these fruits can be dried in the open air.

There is another way in which we prepare fruit so that it will keep. This is by *canning*. The fruit is put into cans with a little water and sometimes sugar. It is then heated and carefully sealed. Go where you will through our homeland you will find canneries. A very great amount of fruit is canned. You can hardly form a picture of it in your minds. Mention the different kinds of fruit and vegetables that you have seen in cans. Here in California we should eat fresh fruit and vegetables. It is better for us. Canned fruit and vegetables are for those who cannot get them fresh.

Orchards and gardens have spread over our valleys like magic. You can ride through them for hours. California is the most wonderful garden in the world. No other people have so many kinds of fruits and vegetables throughout the whole year.

This is the picture of our land, first as the home of cattle and sheep, then of wheat and other grains, next of fruit and vegetables for our own use. Then,

last of all, it is the picture of the place where half of all the fruit and vegetables eaten in our country is grown. This picture is the fourth part of the story of our magic land. There is more yet to our story.

How could we get along without good roads and automobiles? Before there were automobiles people used horses and wagons or carriages. The roads were rough and rocky. Sometimes the dust was blinding. Sometimes the mud was deep. Do you think you would enjoy such riding?

Now our roads are hard and smooth. Have you watched men at work making one of these roads? What materials do they use? Where do these materials come from?

Good roads now lead from every valley to the Los Angeles markets. Good roads lead to the packing houses and canneries. Good roads will take you on pleasure trips to the mountains and beaches.

If you have fruit or vegetables or eggs or milk or cream you can take them to market. It does not matter how far you are away. They will reach the market without injury. Hundreds of trucks loaded with country produce reach Los Angeles every morning. Some of the trucks have come more than one hundred miles. Some of them have come from the San Joaquin Valley. They have crossed two mountain ranges. It would take three or four days to make such a journey with horses and wagon.

The different valleys of our land grow different things. With the help of good roads we can exchange

products. You can send me early cantaloupes. I can send you mountain apples. Ships bring fruit from other lands. This fruit goes over good roads to every part of our land. This is the end of the fifth part of the story of our magic land.

We have now come to the sixth part of the story of our land. This is the story of what cheap fuel has done for us.

It was thought many years ago that Mother Nature forgot one thing when she made Southern Cali-



The San Fernando Pass or gate opens north through the mountains that lie north of the San Fernando Valley. We go through this gate and then up a long narrow valley to the Soledad Pass or gate, shown on page 146. The picture shows the old road used by wagons before there were automobiles. The new road goes through a tunnel instead of an open cut through the mountains.

fornia. This thing is *fuel*. There is no good coal. The forests are far away in the high mountains. Let us now find out something about the kinds of fuel and what they are used for.

Anything that will burn and make heat we call *fuel*. Wood is the common fuel in most places. We use it to cook by and to keep ourselves warm in winter. Peat is another fuel. It is made of plants that once grew in swampy places. There is some peat in our land. Who will tell what it looks like?

Coal is also made of plants that grew in swamps. But it was long, long ago that coal was made. Do any of you know where the coal we burn comes from?

Petroleum and natural gas are valuable fuels. Nature made them from bodies of tiny creatures that once lived in the ocean. These creatures were not animals, neither were they plants. They were part way between. All our petroleum fields were once deep under the ocean. Some of them are still under the ocean. There are springs of petroleum in the water between Santa Barbara and the Channel Islands.

Layers of hard rock hold the gas underground. Some of it is more than a mile deep. It tries to get out very much like the steam in an engine boiler. Where there is a crack in the rocks it finds its way to the top of the ground. If there is petroleum and water where the gas comes from it brings them along with it. This is the way the tar or brea springs near Los Angeles were made.

When an oil drill makes a hole through the rocks the gas escapes and brings petroleum with it. The gas makes a roar like the steam from the safety valve of an engine. Sometimes the gas takes fire. Then great harm may be done.

Why do we prize petroleum and gas so highly? Do we use them for anything besides cooking, warming ourselves, and lighting our homes? Most steam engines once used coal. We have no good coal. What could we do for fuel? It was discovered that gas, gasoline, and petroleum would do almost everything that coal could do. Think of the thousands of engines that are now working for us. Think of the machines they are turning in factories. Think of the automobiles gasoline is running. Cheap fuel is the final reason for the growth of our homeland.

These are the stories of how the work of our land has changed.

We still raise cattle, but mostly for milk, butter, and cheese. We still grow grain. We still carry on mining. But the most of our people spend their time growing vegetables and fruits and in making things of every kind.

SUGGESTIONS TO THE TEACHER

Model upon the sand table the San Gorgonio Pass with San Jacinto Peak on the south and San Gorgonio on the north. Make San Jacinto very steep on the eastern desert side and San Gorgonio a little the higher. Put Beaumont and Banning in the middle of the pass. Make the pass broad and flat so that

the railroad can easily climb the slopes both from the east and the west.

Model the San Fernando Valley with its rim of mountains on all sides except where the Los Angeles River flows out. Show the Soledad Pass and the railroad tunnel at the north end on the route to the San Joaquin Valley. Show the other at the west end on the Coast Line Route.

Model the high Mohave Desert between two mountain ranges. Show the steep descent to the San Joaquin Valley with the winding railroad crossing itself. Tehachapi lies in a mountain valley between the Mohave Desert and the San Joaquin Valley.

Show on the sand table why it was so difficult to build a railroad from San Diego to Imperial Valley, and how the route up the coast to Los Angeles was quite easy.

THINGS TO TALK ABOUT AND DO

Find out what we mean by *range* cattle. Get pictures showing cattle on the range. We may think of a range as a great wild pasture where cattle wander in search of food that Nature provides. Sometimes ranges have no fences around them.

When we keep cattle, sheep, or other animals in small fenced fields we speak of these fields as *pastures*. Cattle kept in small pastures have to be fed hay, grain, and other foods. This is because there is not enough natural food. Most of their food is grown by cultivation. Can you tell the name of the hay usually fed cattle?

Why is it that by growing their food a farmer can keep more cattle, sheep, or horses on the same land than he can if he lets them run wild and pick up what Nature supplies?

Range cattle and sheep are usually kept on land that is not good for anything else. In what parts of our homeland will you find poor, rocky, and dry soil? In what parts do you find dairy cattle?

Those who raise range cattle have little work to do. Those who keep dairy cattle have a great deal of work. Why is this?

Why is it more work to take care of sheep than range cattle? Which will do better on dry, desert lands?

Why is it easier to grow wheat than it is fruits or vegetables?

Why does the wheat farmer sometimes have a very poor crop?

Do those who grow vegetables and fruit always get a good crop? If they do not what is the reason?

Why does the fruit-grower usually have a more comfortable home than the grain-grower?

Where does the water in your home come from? Does it come from a spring, well, or through a pipe from some reservoir? Why is spring water the best?

Where is the coldest spring from which you have drunk? Was it in the lowlands or in the mountains? Can you tell why it was cold?

Where does the water of the raindrops come from? Why might we call rain water distilled water?

Tell what you have seen of the ways by which fruit is canned and dried.

Tell about the different uses of crude petroleum, of kerosene, or gasoline, and of natural gas.

If you kept a dairy for making butter and had no ice, where would you have to take the cows in summer?

NEW OR UNUSUAL WORDS

thrive chamber distill settle ranch prepare

CHAPTER XV

SOUTHERN CALIFORNIA IS A LITTLE WORLD ALL BY ITSELF

LET US THINK of Southern California as shut away from all the rest of the world. Let us picture in our minds a great wall of mountains on the land side. There are no gateways through these mountains. They are so high and steep that no one can cross them.

Let us picture the ocean on the other side of our land. There are no bays in the shore of this ocean. There are no spots where ships can anchor safely. The whole shore is rocky. The cliffs are so high no one can climb them.

What would happen if these pictures were true? What would happen if we were shut off from all the rest of the world? Could we get along and be comfortable and happy with only those things that our homeland could supply?

Let us think first of our food. The one thing that we must have is food. We could do with very few clothes. We could do without houses.

We grow all kinds of grain that people use for food. There are wheat, barley, oats, corn, rice, and rye. Rye does best in a cold climate. We think wheat is the most important of the grains. It would be hard to go without bread made of wheat. Have

you ever tasted rye bread or rye crisp? Can you find out why in some countries people eat mostly rye bread.

After wheat we consider corn the most important of our grains. In what different ways do we eat corn? In what sort of places does corn do best? We use much rice. In what part of our land does rice grow best? Will corn and rice grow with only Nature's watering? In what form do we eat oats? Do we eat much barley? What is the chief use of barley?

All kinds of grain do well in California. In Southern California we do not now grow much wheat, so we buy the most of the flour we use. We could build mills and grind our own wheat. Perhaps we would be healthier if we ate less bread.

We grow almost all kinds of vegetables and fruits. What fruits from across the ocean do ships bring? Where do coconuts, bananas, and pineapples come from? Do they come from hot or from cold lands? We enjoy these fruits, but we could get along without them. Before there were steamers they never reached our homes.

We do not grow spices. Do you know where these come from? The Spice Islands are far away on the other side of the world. We could get along very well without any of them. Cloves and pepper are not good for us.

In our markets are dates from the Sahara Desert and from the Persian Gulf. You remember about the dates in the stories of Arab children. The date

is a very good food. Have you eaten any of our California dates? We are growing many dates in the Coachella Valley. What kind of a climate does the date palm like? We shall soon grow all the dates that we can eat.

We once ate figs that came from Smyrna. This is in the far-away land of Turkey. We eat a great many raisins. These once came from Spain. You remember that this is the old home of the first white people who came to California. It is the home of the fruits they brought with them.

Now our raisins come from Fresno. Is Fresno inside or just outside of Southern California? We grow raisin grapes and could make all our raisins. Can you tell why we make so few raisins in our homeland? Ocean fog gets into most of our valleys in summer. Has this anything to do with raisin-making? Can someone tell why there is no fog in summer in the great valley around Fresno?

There are apples in the markets grown in our own land. There are also apples from Oregon and Washington. What kind of a climate does the apple like best? Where in our homeland are there valleys that the apple likes? Can we not grow all the apples we want?

Our land grows many walnuts and almonds. But in our markets are also Brazil nuts, pecans, and filberts. Can you tell where these nuts are grown? We buy Brazil nuts, pecans, and filberts because we like them. But we really do not need them.



Can you tell from what this picture shows where the palm is growing? What do you think the bunches are made of that are hanging from the top? Might the palm be in Coachella Valley? Are the people dressed as our people are? Does the house look like any in our deserts? Call to your minds the stories you have read about the lands from which the golden dates in our markets come.

We use a great deal of tea, coffee, and cocoa. These come from lands far to the south. Jack Frost never reaches these lands. Is there any place in our homeland where there is no frost? Why is there the least frost near the ocean? We could get along without tea, coffee, and cocoa. We would be healthier if we did not have them. Have we found any food that we must have that we cannot grow?

Let us now think about our clothing. What do we wear that our land could not supply? Wool, cotton, silk, and leather are the four chief materials of our clothes?

California was once the land of cattle and sheep. Could we now raise all the sheep needed to supply us with wool? Our climate is warm. Which of these materials do we need most? Could we not use more cotton and less wool?

Have you seen the trucks loaded with cotton on their way to San Pedro? In what part of our land is this cotton grown? Ships take the cotton from San Pedro to other lands. There it is woven into cloth. We have cheap fuel, plenty of workmen, and a suitable climate. We might build factories and weave all our own cloth.

Steamships unload great cargoes of silk in our harbors. A cargo of silk is worth almost as much as a cargo of gold. Can you tell where this silk comes from? It is unloaded from ships and placed on cars. It is then taken to factories in the East. There it is woven into cloth. Then it is sent back to us.

We have all seen the little silkworm feeding on mulberry leaves. The mulberry tree feeds silkworms and also gives us delicious fruit. Have you ever eaten mulberries? Each silkworm, when it has eaten all the leaves it can, spins a cocoon of silk threads about itself. At the proper time the threads are unwound from the cocoon. They are then ready for weaving.

The climate of our land is warm like that of the land from which the silkworm comes. We could, if we so wished, grow the mulberry trees and raise the silkworms to make all the silk we need.

For what purpose do we use leather? Of what is it made? We raise many cattle and sheep. We could make our own leather. Now other people prepare our leather for us. We could put up factories and make our own shoes. Now other people make our shoes and sell them to us. Could we get along without leather? What substances are often used in shoes in the place of leather?

Let us now think of what our houses are made. Do we use any materials that our homeland could not supply us?

We have learned how the early settlers made their homes. Will you tell us what you can about these homes? Tell of any adobe houses that you have seen. Were all the materials of these houses found in our land?

The people of the East are used to wooden houses. When they came to California they wanted to build

their new homes of the same materials. So we now send to the far-northern forests for lumber. Why does this lumber come by boat and not by train?

But do we really have to send away for lumber? Pine trees make good lumber. We have pine trees on our mountains. We might use these trees if we were careful to plant others in their place. We should plant at least two trees for every one we cut. You will learn in another chapter why we should be very careful of our forests.

You have all seen the tall eucalyptus trees. All of these were set out by white people. They have all grown since white people came. Eucalyptus makes good fuel for our fireplaces. It also makes good furniture. We might grow other trees for wood and lumber if we needed them.

You have all seen the huge buildings in our cities. How many stories high are some of them? Such great buildings must be made very strong. They must be made of materials that will not burn. Very little wood is used in these buildings. They are made of iron or steel and concrete or cement. Sometimes blocks of stone are also used.

Cement is made of different kinds of rock ground together and then burned. If you wet this powder it becomes as hard and strong as real rock. We might think of a great concrete building as solid rock with wholes cut out for the rooms.

Some of you have watched one of these great buildings grow. What kind of a frame do the men



A bunch of ripe dates just as it grows on the palm. There are often four or five such bunches on a single palm. There may be over one hundred pounds altogether. You can tell that the dates are ripe because they have shriveled a little.

put up first to make the concrete stronger? Where does the iron of this frame come from? Have we any iron mines?

We make great quantities of cement. We use it in making homes as well as great factories and office buildings. Who will tell us where Colton is? Visit Colton and you will see an interesting sight. Many men are at work making cement. They are tearing down a mountain to get lime. There are many buildings and many kinds of machinery.

We have no iron mines in this homeland we are studying. The steel frames of our buildings are brought here by boat. The iron is mined and made into steel in a far part of our country. Iron articles such as tools and machinery are brought by cars.

Iron is the first thing we have found that we would miss greatly if our land were really shut in by a great wall. Is there anything else? We use a great deal of copper. Can you tell some of the ways that this metal serves us? We have a few copper mines. Most of our copper comes by train or boat.

How wonderful our land is! It has everything we need to eat. It has everything we need to wear. It has everything for our buildings except iron and copper.

THINGS TO TALK ABOUT AND DO

What kind of bread do you like best? What kinds of bread have you eaten?

If there were no wheat flour, of what could you make bread?

If you wanted to become a miller and there was no fuel to make the machinery go, what other power could you use? There are three different ways.

Visit a health food store and watch the little grist mill make any kind of flour you want.

Discuss the kinds of food we need in order to be strong and healthy.

Are there any foods we really need that cannot be grown here?

By what way could food reach us if there were a high wall all around our land?

Do you know of any foods that we might grow but do not grow?

Can you think of any materials besides wool, cotton, silk, and leather out of which we could make clothing?

What do you think about our being stronger if we wore less clothing? Could we get along without hats and wear sandals instead of shoes?

What are the advantages of a home made of cement compared with one made of wood? Which is cool in summer and warm in winter?

What other metals besides iron and copper do we use every day?

Of what different materials are our dishes made? Are there any dishes made in our homeland?

Are there any minerals mined in the mountains of our land? If so can you tell what some of these are?

NEW OR UNUSUAL WORDS

cliff anchor material frame

CHAPTER XVI

WHY DO SO MANY DIFFERENT KINDS OF PLANTS THRIVE IN SOUTHERN CALIFORNIA?

NATURE put many kinds of plants in our homeland. Each kind feels most at home in the place in which we find it growing. If we take one up and plant it in another place it may droop and die.

Men have brought many kinds of plants to this land of ours. Some thrive because their new home is like their old one. Some will not grow here no matter how much care we give them.

Plants, animals, and people are alike in many ways. They all have to eat and drink and breathe. Some plants need little food. Others must have much. Some plants can get along with little water to drink. Others must have a great deal. Some love dry air. Others will grow only in moist air. Some will stand very cold air for a part of the year. Others wilt and die if Jack Frost touches them.

We love our warm air and sunny skies. We would not be happy in a cold, cloudy land. The Eskimos are happier in their icy land than they would be here. Desert people would not leave their home for any other.

The verbena loves the sand and warm sunshine. It does not care whether the air is dry or moist. You will find it on the sand dunes by the ocean. You will also find it on the sand dunes of the desert.

Ferns like the shady places that are always wet. The best apples grow where the winters are cold. The orange is sweetest where it gets a great deal of hot sunshine. Artichokes prefer the cool foggy air along the ocean. They do not care so much about the kind of soil they have as they do about the kind of air they breathe.

The date palm must have dry hot air about its top and plenty of water about its roots. Blackberries like our climate, but black raspberries do not. Cran-



These are little flowers that live near the top of one of our high mountains. They have made a home for themselves in a hollow between the rocks. In the winter they are protected by a blanket of snow. Late in the spring, when the snow is gone, the warm sun awakens them. When winter comes again they go to sleep. In what way are they unlike the desert flowers?

berries will grow only where there are cool swamps with much rotting vegetation.

A fruit grower when planting an orchard must think of three things. Is the kind of fruit he wishes to grow suited to the soil? Is it suited to the climate, and can he find a market for it?

Would a fruit grower plant an orange orchard near the coast? Would he set lemon and avocado trees where there is much frost? Would he plant date palms where the air is cool and cloudy?

How does your mother arrange her flower garden? She puts one kind of plant in the bright sun. She puts others on the shady side of the house. She gives one very rich soil. Another does well in poor soil. On cold nights she covers some of them up or brings them into the house.

Some parts of our earth are covered with snow nearly the whole year. Some parts have no rain. Some have so much rain and so much sunshine that plants grow thick and tall. You cannot make your way through them. Some parts are rocky with no covering of soil.

Each kind of climate has plants of its own. Some one may tell about the plants of the desert. Are they like or unlike those near the coast? A wonderful desert plant is the smoke bush. If you take up a tiny one and plant it by your home, although you treat it ever so kindly, it will die.

Some of you have been on the top of a mountain. Tell us if the plants there are like those in the valley.

The little flowers of the high mountains are like those in the Far North. Can you tell why?

Picture in your minds a vast plain. The plain stretches away smooth as a floor as far as you can see. Fancy this plain like the San Fernando and Los Angeles valleys only very much larger. There is warm sunshine over the whole plain. The soil is the same everywhere. One part has as much rain as another. Would you expect to find few kinds of plants on such a plain or would you expect to find many kinds?



Vineyards are irrigated by means of furrows. The water flows down these and is allowed to stand until the ground is well soaked. Our grapevines are usually allowed to grow without being held up by stakes and wires so that the leaves will shade the vines better from the hot sun.

You can answer this question if you think of what we have just been saying.

Now picture in your minds another country. This country has valleys, hills, and mountains. There are sunny slopes and shady slopes. There are dry slopes and wet slopes. There are hot slopes and cold slopes. There are slopes with a soil of rocks and sand. There are other slopes of rich, fertile soil. Would you expect to find few kinds of plants or many kinds of plants in such a country?

Is either of these pictures like the land in which you live? Give reasons for your answers. The class might discuss this question. Each member should give reasons for his opinion.

Let us suppose the second picture is like our land. Which would be the wet slopes, those facing toward the ocean or those facing away from the ocean? Which would be the hot slopes, those facing toward the ocean or those facing away from the ocean?

On what part of a slope would you plant orange trees? Would you put them on the very lowest land or a little way up some slope? Point out, on some slope of a sand model, where you could set out an apple orchard and expect the best of apples. All of you know that cherry trees will not bear fruit in our valleys. Can you tell where would be a good spot for a cherry orchard?

If you wished to engage in lettuce-growing all the year you would have to have gardens in two places. Your winter lettuce must be planted in the

warmest place you can find. Where do you suppose that would be? Give reasons for your answer. Lettuce needs warm weather to grow well, but weather that is not too warm. It does not like the hot sun of summer.

Your summer and fall crop must be grown in some valley that does not get very hot. Can you tell where that would be? Why do nurserymen keep young and tender plants under a lattice or frame-



You have learned something about the Mohave Desert. Do you remember why this desert is so much colder in winter than the Colorado Desert? In that part of the Mohave Desert called Antelope Valley there are fruit orchards. Why is the fruit of these orchards unlike that grown in the part of the Colorado Desert called Imperial Valley? This picture shows a forest of yuccas or Joshua trees in a part of the desert where there is no water. Find the cactus plant.

work of lath? There are two reasons. One has to do with winter, the other with summer.

It would take you a long time to visit all the mountain slopes and valleys of our land. How delightful it would be if you could. Everywhere you went you would find something new. There would be plants, animals, and birds that were new to you.

Our land is a great garden. It is filled with plants from the gardens of many lands. Mother Nature attends to those that she put here. She treats them all in the same way. She puts each kind in its own place. Then she turns them over to the care of the sun, the wind, the rain, and the soil. If a plant is in a place where the soil is poor it will not grow well. If there is little water the plant may die. Then a plant of another kind will take its place. Perhaps the new plant can get along better with poor soil and little water.

The plants *we* have brought here must be tended carefully. They will not repay us if we are careless. We must add food to the soil that is poor. We must bring water where there is not enough. We cannot change the amount of sunshine that strikes the earth. But we can put those plants that want a great deal where they can get it. We can put those that like the cool, damp fog where they can get it.

I am sure you now understand why our land is such a rich and fertile garden. I am sure you understand why there are so many plants in this garden. There are grains, fruits, nuts, and vegetables with-

out number. We have more than any other people in the world. We ought to be healthier and live longer than any other people. Are you not glad that your home is in such a delightful garden?

SUGGESTIONS TO THE TEACHER

Model on the sand table some part of Southern California with which the children are familiar, or you might model an imaginary mountain range extending parallel to the coast and a few miles back from it. Make the model such that under your direction it can illustrate the points brought out in the lesson.

Model an imaginary plain with the ocean far away on one side of it. Of course if the plain bordered the ocean that part near the water would be cooler than the part far away and might receive more rain.

THINGS TO TALK ABOUT AND DO

Think of a number of wild plants each of which grows in a different sort of place.

Think of a number of cultivated plants each of which is suited to a different place.

What do you think we could do here in Southern California if there were no hills and mountains?

From what kind of a country do our date palms come? Do you think they would bear sweet fruit near the ocean?

Let each choose some fruit or vegetable which he would like to grow. Then tell, from what he has learned of our homeland, where he would have to live in order to grow it.

Each plan given may be criticized by others of the class. If it is agreed that the place is a poor one, another may suggest a different place. Discuss all the places given.

Suppose one of you has just come from the East. There your father engaged in growing apples and cherries. Where in our land should he make his home in order to engage in the same business?

We grow cotton and rice and might grow sugar cane. All three thrive in the hot lands far to the south where the summer sun is overhead at noon. The tea plant and the coffee plant also thrive in the same hot lands. Why is it we cannot grow tea and coffee? Think of the following things: The rice plant lives only a few months. It sprouts, grows, blooms, makes seed, and dies before cold weather comes. The tea and coffee plants live from year to year. What might happen to them during our winter?

What else must we have besides the right kind of climate and good soil to make a living by farming or gardening? Talk about markets, and how our produce reaches them.

The persimmon is a delicious fruit. You know how persimmons taste. Many people have never tasted them. This fruit tree comes from China and Japan. A persimmon is very soft when fully ripe. But there the persimmon is carried long distances to market on the backs of men. If these people can market this fruit we ought to be able to do so.

NEW OR UNUSUAL WORDS

wilt rot dune nursery

CHAPTER XVII

WHERE OUR WATER COMES FROM AND WHY SOME PARTS OF OUR LAND HAVE SO LITTLE

PLANTS NEED WATER, soil, and sunshine. Nature gave our land all three. But she was rather short of water when she arranged things. So we prize water more than anything else. Some plants can get along with little water. All those useful to us must have a great deal.

Nature intended us to get our food from plants. Plants get their food from the water and from the soil, with the help of the sun. Nature attends to the sunshine. It is our business to see that the plants have water and fertile soil. If we do not, we may go hungry.

The first question people ask when they think of making a home in any part of Southern California is, "Can we get water there?" Let us now try to find out where water comes from. Do you not think the clouds can tell us about this?

The clouds come from the ocean. The wind carries them over the land. The clouds are made of tiny water particles. Each particle is so small that you cannot see it by itself. When there are many particles close together you see clouds or fog.

When many of the little water particles join they make raindrops. If it is cold they make snow or

hail. The raindrops, the snow, and the hail are heavier than the air and fall to the ground. The most of this water gathers in rivulets and runs away. These rivulets unite and make creeks. The creeks unite and make rivers. The rivers flow away to the ocean.

A part of the water soaks into the soil or earth. Underneath the loose earth there is solid rock. There are tiny cracks in this rock. The water finds its way into these cracks and follows them a long way. After a time it comes out into the sunlight again as a spring. The water of such a spring is pure, clear, and cold.



Did you ever visit a mountain valley in the spring and see the melting snowbanks? Because of the cold the winter storms bring snow instead of rain. When the sun shines warm the snow slowly melts and forms little streams which feed the rivers. This is one of Nature's ways of guarding against floods.

There are many of these springs that feed the rivers. In summer, springs supply nearly all their water. In winter the rains come to the help of the springs. The clear rivulets become muddy torrents. What a flood the rivers now carry to the ocean!

Not all of the river water is lost in the ocean. Some of it sinks down into the sand of the river bed. It creeps into the gravel that lies under all our fertile valleys. Some places it is deep under ground. In other places it is near the top. These gravels are Nature's great storehouse of water. Dig a well wherever you please and you will come to water. Put in a pump and you can have water for any purpose you wish.

Take a small dish of salt water and put it where it can be kept warm. Set it either in the sun or on a stove. Let it stand and watch what happens. After a time the water is all gone. But something white is left in the bottom of the dish. Taste it and you will quickly find out what it is.

The water that was in the dish has gone away into the air. We say it has *evaporated*. The water went away in particles so small you could not see them. There are water particles in the air about you all the time. How do we know this is so? If the day is warm you can see for yourself.

Fill a glass partly full of water. In this put a piece of ice. Wipe the outside of the glass dry. You will soon see particles of water gather on the dry glass. The water cannot have come through the glass. It

must have come out of the air. It is the cold glass which makes the tiny particles of water gather on the outside. We say the particles are *condensed* on the glass. Condense means that the tiny water particles are brought together and made large enough so we can see them.

Let us suppose it is a summer day at the beach. There is a cool breeze blowing off the ocean. Can you tell why this breeze is cool? Soon the cool breeze brings fog with it. The fog covers up everything. Even the sun is hidden. It is so cold we put on our coats. We know the fog came from the ocean, for the wind came from that direction. And, besides, we can hear the fog horns and the sirens of the steamers that are caught in the fog.

The fog has spoiled the day for us. We turn toward home. After we have gone a few miles we come out of the fog into the warm, bright sunshine. What has become of the fog?

The ocean is cold. The air over it is cold. Tiny particles of water are rising from the ocean all of the time. They rise just as they did from your little dish of salt water. If the air were warm you would not see them. But it is so cold they are condensed. By this we mean that many little particles unite or come together. This makes them large enough so that you can see them.

The wind carries the fog over the land. In the daytime the land is warm. The water particles cannot go very far over the warm land before they also

become warm. Then they grow small again so that you cannot see them. This is the reason you came out of the fog on your way home.

When the sun goes down the land begins to cool off. Then the little water particles flock together again. They float far across the valleys. They do not stop until they run against the mountains. When the warm sun strikes them in the morning they become small again so that you cannot see them. We say that the fog melts away. The fog behaves just the same as the particles of water that gathered on your glass of ice water.



In this picture we are on a mountain looking down on the fog which often fills our valleys on summer mornings. Does it not look like the ocean? The fog has buried all the lowlands, but the mountains stick up through it as islands and peninsulas. Point to a large island. When the sun gets higher it will warm the air and the fog will melt away. You can think of the fog as a blanket that the valleys put on at night.

The little water particles are always rising from the ocean. When the air over the ocean is cold you can see them. When it is warm they are invisible. There is then no fog. They leave all the salt behind them as they rise in the air. This is why the rain-drops are always fresh water.

When the little particles float close to the earth or the water we call them *fog*. When they float high in the air we call them *clouds*. When an aviator sails into a cloud it seems to him just like fog. We might call the clouds *high-fog*. Or we might call fog low clouds.



The beautiful white primrose that springs out of the sand of the desert if there happens to come a spring rain. When the rains do not come the sand remains bare except for the few creosote bushes.

Many of you have been up the cable railway to Mount Lowe. One who has been there might tell about the ride. You remember the wonderful view over the Los Angeles and San Bernardino valleys.

Perhaps you have been at Mount Lowe when fog hid the valleys below. You looked down on the top of the fog. It seemed like a great ocean. Above you floated the real clouds. These piled up in great thunder heads. They seemed miles high. Can you tell why we call them "thunder heads"?

Fog is like a blanket. It clings close to the earth. Fog is sometimes very wet. It wets your clothes and drips from the trees. But it never brings any real rain. The thunder clouds that pile up above the mountains sometimes bring rain. The water may pour down in torrents for a few moments. There is thunder and lightning.

When winter comes clouds take the place of fog. They come from the ocean just as the summer fog does. The wind carries them over the land. When the south wind begins to blow and clouds spread over the sky we say, "It is going to rain."

Now let us see if we can find out why the fog brings no rain, while the water from the clouds sometimes almost drowns the land. The cool ice water condenses the water particles on the outside of the glass.

Remember that it is *cold* which makes the water particles come together. When aviators fly very high do they put on light summer clothing or the heaviest, warmest clothing they can get? What does this tell

us about the air very high above the earth? Is it warm or very cold?

Let us suppose it is winter. The wind is bringing rain clouds from the ocean. Soon the warm rain begins to pour down. Finally the wind changes into the north. The clouds break up and the blue sky peeps through them.

Everything is bright and fresh. Flowers are blooming. Garden seeds are sprouting. Leaves are unfolding. But what a strange sight the mountains are! Baldy, Grayback, San Jacinto, and all the other high mountains are white with snow.

What do you think would happen if the summer fog could be whirled very high in the sky? The little water particles would find it very cold there. They would run together and make raindrops. If it were cold enough the little particles would freeze and make the beautiful snow.

You have all seen the dust whirls that pick up dust and bits of paper. Think of such a whirl that is very large. Think of one that is many miles across. Think of one that is strong enough to carry the fog particles higher than the mountains.

The glass of water helps us to understand why it rains in the valleys and snows on the mountains. A rainstorm is a great whirl of air.

In summer there are no whirls. The water particles, which make the fog, creep along the earth. In winter the whirls carry the water particles high in the air. This is the way our rain comes.

We have learned that there is a rim of mountains running through our land. One side of this rim or water-parting slopes toward the ocean. The other side slopes away from the ocean.

The clouds come from the ocean. The winds carry them against the mountain rim. The slope toward the ocean gets a great deal of rain or snow. What do you think happens on the slope away from the ocean? Does it get as much rain or does it get very little?

In our valleys about half as much rain falls as on the mountain slopes. You have learned enough now



A wonderful cactus garden in the desert at the foot of the mountains that shut off Imperial Valley from San Diego. Point out the two kinds of cactus. Would it be pleasant going barefoot here? The tall bush is the ocotilla. Its red blossoms come at the ends of the long, slender arms.

so that you can tell why this is. Mountains are rain-makers. Do you think we could get along without them? We shall soon find that they are useful in other ways.

Some of you have been in the land on the other side of the mountain rim. Are the plants there like or unlike those on the ocean slope? Do they look as though they had much rain? How would the country look if there were no rain at all? Would there be any plants, animals, or birds?



This is looking east from the top of North Baldy, which you know is one of our high mountain peaks. You can see the sharp mountain edge, which forms a water parting. The rain that falls on the sunny side flows away to the Mohave Desert. That which falls on the shady side helps to make the San Gabriel River and thus flows to the ocean. Do the trees look as though they had a hard time of it? Can you tell from the shape of the trees on the right which way the hard winds blow?

The plants of the slope away from the ocean are strange looking. Many of them have spines or thorns in the place of leaves. Others have very small leaves. This helps them to save their sap or juices. If they had large leaves they would soon lose so much moisture that they would die.

The desert tortoise is a curious animal. It has a wonderful pocket under its shell. It stores water in this pocket. It can go many months without drinking.

After Nature had placed the mountain rim she found she could get only a little water to the side away from the ocean. This is why we call that land a desert. In the spring some rain gets past the mountains. Then the desert is carpeted with flowers. You should all visit this land in flower time.

SUGGESTIONS TO THE TEACHER

A blackboard sketch might be made from a sand table model showing a cut through an imaginary mountain. Such a sketch might bring out the following points:

Solid rock in the heart of the mountain.

Crumbled rocks near the surface.

A layer of soil in places, usually very thin.

Trees and bushes growing on the slopes.

Cracks in the solid rocks of the mountain.

Water following these cracks downward might meet other cracks which would take it to the surface lower down the slope.

The children should be led to understand that land near the ocean does not necessarily get much rain. In summer the

air near the ocean is often more damp than it is in winter, and yet there is no rain in summer.

Some of the worst deserts in the world are near the ocean with winds blowing directly from the ocean onto them. They do not get rain because the land is much warmer than the ocean. This makes the air over it warmer. There are no whirls to carry the moist ocean air to any height. The principle is the same as that shown in the melting away of the fog as we go inland from our coast.

THINGS TO DO AND TALK ABOUT

What is the difference between fog and clouds?

What is the difference between the water particles of fog or clouds and those that fall as rain?

Have you been under eucalyptus trees in a dense fog? Why does water drip from these trees then? Might it be because the leaves are colder than the air?

Ollas are used to make drinking water cooler in summer. Has any one of you seen a Mexican olla?

You have learned something about ocean fog. In winter there is another kind of fog, which we call *valley fog*. It is called *tule fog* in low wet valleys where there are tules growing. You all know how cold valley fog is.

We usually have valley fog or tule fog in winter. The coldest air settles to the bottom of the valley. Water evaporates from the ground just as it does from the olla. The cold air makes the water particles large enough so you can see them.

Does this help you to see why the bottom of a valley is not a good place for an orange, lemon, or avocado orchard?

NEW OR UNUSUAL WORDS

particle torrent siren moisture

CHAPTER XVIII

WHY SOME PARTS OF OUR LAND ARE HOT AND OTHERS ARE COLD

FAR TO THE SOUTH the sun is overhead at noon. There the air is always warm or tropical. The people who live there wear little clothing. Far to the north the sun never gets very high in the sky. Everyone who goes there must dress in warm clothing.

This home of ours lies between the warm lands and the cold lands. The most of it is neither very warm nor very cold. We say that it has a *subtropical* climate. By this we mean that the climate is almost tropical.

All of you know there is one great valley in our land where it is very hot in summer. It is hotter than the land far to the south where the sun stands overhead at noon. Iron tools become so hot they almost burn one's fingers. One cannot go barefoot, for the sand burns the feet.

All of you have seen the snow on the high mountains. It is almost as cold there in winter as it is in Eskimo land. Do you think we can find out why we have so many kinds of climate? Let us try.

If our land were long from north to south that would help us. The sun would not rise as high in the sky in the north as it would in the south. That would make it hotter in the south. But our land is

not very large. So this does not explain what we want to know.

The sun does its best to give all parts of our land the same amount of light and warmth. It may shine ever so brightly and yet not warm the earth very much. Something gets in its way. This is what we want to find out.

It is morning of a summer day. The sun has come up bright and clear. The air will soon become very warm. It is just the day for a picnic. The children who live in a valley near Los Angeles want to find a place that is cool. One says, "Let us go to the mountains." Another says, "This is just the day for the beach." There surely will be no fog because the ocean breeze is gentle. We will go to the mountains some other day when there is fog. Can you tell why the mountains would be pleasant when it is foggy at the beach?

What a happy time they had! The sun shone brightly all day. There was breeze enough to make the air cool. But it brought no fog because the sun had warmed the air too much.

How hot the sand became to their feet! But how cool the blue-green ocean water was! The sun did not seem to warm it at all. They put up their tent and camped all night. In the morning the sand was no longer warm. It even felt cold to their bare feet. The ocean water seemed warmer than the sand.

This is because the sun warms the land quickly. It cools as quickly when the sun is gone. The ocean

is very large and deep. The waves and currents are always stirring the water. They mix the top, that has been warmed a little, with the cool water underneath. Because of this the ocean does not change from day to day. In winter when the sun is low it cools a little. In summer it warms a little.

The wind that blows from the ocean is always cool. It does not matter how hot the sun shines. The ocean is like a great refrigerator. Sometimes there is a hot wind in summer. Can you tell from what direction it blows?



Compare the great pine tree in this picture with those on pages 81 and 261. What makes you think it is having a hard time to grow. Does it look happy? The picture shows the top of a high ridge in the San Gabriel Mountains. The winter winds are fierce and cold. They keep nipping the tops of the trees and making them grow out sideways instead of upright.

The sand is a part of the solid land. When the sun shines on the soil and on the rocks they behave just as the sand does. The land gets very warm during the long summer days. In the winter the days are short and the sun is low. The land then loses more heat than it gets from the sun. Because of this it becomes cold.

The sea breeze is always cool because it blows over the cool water. The water of the great ocean is almost the same winter and summer. The water of a lake becomes warm in summer because there is little of it. Perhaps now you can tell why a winter wind from the land is colder than a winter wind from the ocean.

Surely you know why Santa Monica is cooler in summer than is Los Angeles. You must know also why San Bernardino is warmer in summer than Los Angeles. You know why Imperial Valley is warmer than San Bernardino.

We have now come to the story of the cool sea breeze and the fog that it brings. The sea breeze tells of its struggle with the sun as it passes over the land. The sea breeze tells us that the farther it goes from its ocean home the warmer the sun makes it. Before reaching Imperial Valley there is nothing left of it.

Let some one who lives by the ocean tell why the sea breeze is always cool.

Some one who lives near Los Angeles may tell about the breeze there.

Some one who lives in Pomona may tell why his home is a little warmer than Los Angeles.

One who lives in Redlands, Riverside, or San Bernardino may tell why the sea breeze there is quite warm.

A pupil in Imperial Valley may tell why there is no sea breeze there.

All the land sloping toward the ocean is cooled by the sea breeze. That nearest the ocean is cooled the most. That farthest away is cooled the least.

High mountains stop the sea breeze. The sun makes the land behind the mountains very warm. How does the sun seem when you are out of the breeze?



This is a view of Old Baldy from a farm or ranch near Santa Ana. What does the palm tell you about the climate here? Why is it that only the top of Baldy shows snow? What falls in the valleys when it snows in the mountains. Do you not think ours is a pretty land, with its snowy mountains and its green, fertile valleys?

Suppose for a moment there were high mountains between Los Angeles and the ocean. What kind of a summer climate would the city have? Would there be any sea breeze or fog? What would be the climate of San Bernardino if there were a range of mountains between it and the ocean?

Let us think now of the mountain rim that divides our land into two parts. We have learned how the sea breeze cools the slope toward the ocean. What happens on the other slope? Does the sun have his own way there?

You remember that when we looked toward the east from Los Angeles we could see a gap in the mountain rim. You remember the two great peaks that guard this gap or gate. You remember that the first railroad from the East to Los Angeles came through this gap.

The sea breeze finds this gap. A little gets through it but it does not go far. It soon becomes so warm you would not know it. It is a wonderful sight to stand on either San Jacinto or San Geronimo and watch the fog creep through the gate. The hot desert sun melts it away before it has gone far.

The sun has his own way on the slopes of the mountain rim that face away from the ocean. The mountains cut off most of the rain and all of the fog and sea breeze. This land almost bakes under the summer sun. The sun shines hotter here than it does in those far southern lands where people wear little clothing.



These two pictures show a party of people on the top of San Geronimo, our highest mountain, more than two miles above the ocean. In the first you can see the monument. Find the little bush at the right that is trying to live where there is little soil and the winters long and cold. The second picture shows the party eating lunch behind the rocks out of the wind. Find the snowbank and the tiny tree trying to keep alive.

This hot summer land was once called the Colorado Desert. Now we call it Imperial and Coachella valleys. From these valleys we now get delicious dates, grapefruit, winter lettuce and peas, early cantaloupes, watermelons, and grapes.

How these fruits and vegetables thrive under the hot sun when we give them water! Nature gave this land a fertile soil and a hot sun. But she also made mountains that keep the rain from reaching it. We have supplied it with water from wells and from a far-distant river. You have all heard of this river. Los Angeels may get water from it sometime.

We are glad now that we have this desert land. We are glad that Nature put the rim of mountains where she did. We can grow things here that will not thrive in any other part of our land.

But this is not all of our story. The mountain slopes and high peaks will tell us the rest of it. The mountain valleys are above the fog. We have learned how the fog creeps into the lowland valleys and hides them from the sun. We have looked down on the fog from Mount Lowe or Mount Wilson.

Far up in the blue above the earth it is always cold. The sun shines through the clear air without warming it. Near the earth the air is warmed. This is because the heat is reflected from the earth back into it. You all know how a mirror reflects the sunshine. You have all stood in front of an electric heater and felt the warm air. The heat is reflected from the surface of the polished metal mirror.

The high mountain peaks are the coldest places in our land. The tops of low mountains and hills are not so cold. Valleys are the warmest of all. Aviators have flown higher than the highest mountains. They say the farther they go the colder the air becomes.

Mountain slopes are delightful places for summer camps. The air is cool. The water is pure. There are great pines and other trees for shade. In winter everything is frozen up and the snow falls deeply.

Fruits thrive in our mountain valleys that are not at home in the lowlands. Can you tell what some of these are?

This is the story of how Nature has given us almost every climate you can think of. This is the story of how we can grow so many different kinds of fruits.

SUGGESTIONS TO THE TEACHER

Sand models can be introduced to advantage in connection with several of the topics.

One lesson the children should learn from this chapter is that the height of the sun, if taken by itself, does not tell us how hot a climate a place has. Many of the children have made the journey from the coast to Imperial Valley and have experienced the great difference in climatic conditions, but doubtless have never thought what makes the difference.

If the pupils have the fact impressed upon their minds at this stage, that the nearness to or distance from the ocean, direction of the prevailing winds, and position of the mountain ranges have a very great deal to do with the matter of

climate, they will be much less apt to misunderstand the significance of latitude, or distance north or south of the equator, when they have got further along in their school life.

The children of Southern California can have the influence of climate, slope, soil, and elevation upon productions and industries made very clear to them because of the different conditions within a few miles of every school.

A sand table model might be used to show how the ocean breeze warms as it passes different towns on its way to the San Geronio Gate and Coachella and Imperial valleys.

Such a model could be used to illustrate how the sun shines on the fog, slowly warming the air, which finally causes it to melt away. When the fog has gone the air warms rapidly because the sun's rays then reach the earth and are reflected back into it.

The children should be shown that when the wind blows from the desert in summer the heat is due to the reflection from the bare rocks and sand on which the sun is shining. This hot air has to go over the mountains to get to the coast slope. The mountains cool it a little. The green vegetation of the valleys cool it more. By the time it reaches the ocean it is much cooler than it was in the desert.

The children should be shown why the gardener and orchardist have to do more irrigating when the desert winds blow than when the winds blow from the ocean.

The children at this stage are fully capable of understanding why there is little change in temperature between winter and summer, night and day, near the ocean, while in the desert it is very great.

The road from San Diego to Imperial is a wonderful example of the great change in life condition within the distance of a few miles.

NEW OR UNUSUAL WORDS

tropical struggle farthest reflect

CHAPTER XIX

WHY SOME OF OUR SLOPES HAVE DEEP, RICH SOIL AND OTHERS HAVE VERY LITTLE SOIL

ALL THE LAND is made up of slopes. In some places the slopes are very steep. In other places they are gentle. Sometimes the land seems to have no slope at all. But is the land perfectly flat anywhere? The water would not run off if it were.

The raindrops that fall upon the slopes gather in



Did you ever go to Long Beach and walk toward the south along the beach until you had passed the last house? If you have you would see this cliff. The layers of sand and earth were made beneath the ocean. You have learned how the waves and ocean currents work. After a time the land rose to where it is now. Then the waves made this cliff.

rivulets. These come together to make creeks. The creeks come together and make rivers. The water of every rivulet and river is going somewhere. It is seeking the lowest place in the land.

In summer the water is clear. It is then doing no work. After a winter rain it is muddy and angry looking. It rushes down the slopes on its way to the ocean. It is the particles of earth that the water has picked up that makes it yellow and dirty.

Where the creek runs swiftly its bed is full of rocks. Where it runs slowly you will find sand. Where it creeps along you will find the bottom covered with mud.

In the valleys the surface of the earth is smooth and even. In the mountains it is rough and broken. There are great bare rocks and cliffs. Some of you have been in the mountains. You have climbed the steep slopes. You have found the springs where the creeks begin. Let us all make the journey together. We shall surely learn much about the soil and the rocks.

We will start in the bottom or floor of the valley. Here the earth is fine and dark. There are no pieces of rock in it. As we go up the valley the slopes become steeper. Here loose pieces of rock are mixed with the earth or soil. The farmer has picked up many of these and put them in piles. He sometimes makes stone walls with them.

As we go on, the slopes become ever steeper. The creek runs noisily down its channel. It has cut down

through the soil to the solid rock. In places solid rock sticks up through the soil. There must be rock underneath the soil everywhere. But in the valleys the soil is so deep we cannot see the rock beneath it.

We soon have to take hold of points of rock to help ourselves up. There is soil only in the hollows and crevices of the rocks. A few plants are growing among the rocks. Their roots find a foothold in the cracks. Out of these cracks in the rocks they get a little food and drink.

What is the story of the slope that we have climbed? Why is the soil so deep and rich in the bottom of the valley? Why are the high, steep slopes made of bare rock?



This is the great river that we call the Colorado. Many miles below where this picture was taken a large canal carries a part of the water to Imperial Valley. Another part of the water will sometime be brought to Los Angeles and the valleys about it.

Nature has a number of servants at work. They never rest, but are always changing the surface of the earth. The sun heats the rocks by day. They cool off at night. This causes tiny cracks in the rocks. The rain water creeps into these cracks. It slowly softens the rock. High on the slopes where it is cold Jack Frost helps the rocks to crumble.

The pull of the earth starts the pieces of broken rock down the slopes. If the slopes are gentle the pieces creep down. If the slopes are steep they roll or slide down.

The rivulets also help the pieces of rock down the slopes. They do the most of their work when they are swollen by the rains. Then they pick up the rocks



Imperial Valley, you know, is a basin. Tell what we mean by a basin. The most of it has a wonderfully fertile soil. But in some places there is much salt and soda. Plants do not like these substances. In this picture you see a stream of water that flows from a deep well. There is so much salt and soda in the soil that nothing will grow even with plenty of water.

and hurry them along. They rub them against each other and against the bottom. In this way the rocks are slowly ground to sand and mud or silt. These tiny particles of rock make the water look muddy.

By and by the water reaches a gentler slope. Here it flows more slowly. Because of this it has to drop a part of its rock load. The hard rocks and the large ones have not been worn down to sand. These large rocks are dropped first; then the sand is dropped, and last of all a part of the mud or silt.

The creek finally comes to the bottom or floor of the valley. Here it joins other creeks to make the river. After a heavy winter rain each creek is almost a river in itself. The creeks swell the river so that we hardly know it. There may be more water than the channel will hold. Then it will overflow its banks and spread over the valley.

When the water goes down everything is covered with mud or silt. What a time the farmers have cleaning up. They may have to build new roads and fences. But the mud the river left is part payment for the harm it did. Do you know of what this mud is made? It is the finest and best part of the soil of the mountain slopes.

The river has been at work more years than you can count. It has slowly filled the valley with soil. You would have to dig deep to find the bottom of the soil. But at last you would come to solid rock like that of the steep mountain slopes. Everywhere beneath us is the earth's rock skeleton.

The rocks of the mountain slopes are slowly crumbling. Each year a little of this crumbled rock is carried away by the streams. The large pieces are dropped first. The smaller pieces are carried farther down. A part of the silt is left spread over the lowlands. Another part is carried to the ocean.

Tell what you have seen rivulets do upon some slope near the schoolhouse. Let some water from a hose run down a bare earth surface. Does anything happen to the dirt over which the water runs? Where does the water drop the dirt that it has dug out of the slope?



Does it not look as though giants had been at play here throwing great rocks around? This is the summit of the mountains between Hemet and that part of the Colorado Desert called the Borego Valley or desert. You can tell that the mountains are not as high here as in some places because there are the bushes of the algn forest instead of the forests of pines.

Take some soil and put it in a basin with water. Shake it until the water is well mixed with it. You will find bits of stems and leaves floating on the top of the water. These make what we call *humus*. The more humus there is in the soil the better it is.

The water has become muddy and yellow in color. This is because it has picked up the fine particles of the soil. Turn the muddy water off and let it settle. There will be a layer of silt in the bottom of the dish. You will find sand and bits of rock left in the bottom of the first dish.

There are other things in the soil that you cannot see. These are tiny living creatures. They are very useful because they change the soil so that plants can get their food out of it.

The market gardener chooses a gentle slope in the bottom of a valley. Every rain adds to the richness of his soil. Can you now tell why? If his garden were upon a steep slope he would lose some of his best soil with every rain.

Nature is making new soil all of the time. The rocks are always crumbling. The rivulets are forever carrying it to the valleys. This is a true picture of our slopes here in Southern California.

There is another kind of soil you would like to hear about. This is the soil made by the ocean.

A part of the silt carried by the rivers is not left in the valleys. It is carried on and dropped in the ocean. Here the waves and currents are doing their part in soil-making. They spread the silt over the

ocean floor. We think it is lost to us. But sometime the floor of the ocean may become dry land. Very strange things have happened to this world.

The waves are helping make soil in another way. They are always beating against the cliffs. The cliffs crumble as do the rocks in the mountains. The waves carry off the pieces. The very small ones they spread over the floor of the ocean. The larger ones they use to make the clean sandy beaches.

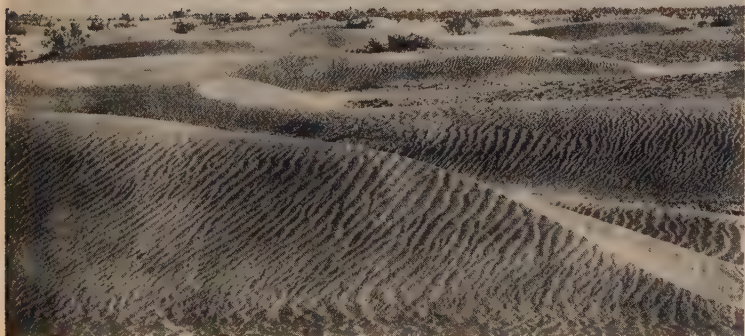
The ocean was once higher than it is now. The ocean covered all the Los Angeles plain or valley. The San Pedro or Palos Verdes Hills were then an island. In this long-ago time the rivers brought down silt as they do now. The waves and currents spread it over the bottom. The bodies of the sea animals that died sank to the bottom. They mixed with the silt or mud. They helped make it rich in plant food. Then the water went back. We might say the land rose from the water. The soft mud of that old ocean bottom now makes some of our best soil.

A part of our land, as we have already learned, lies to the east of the rim of mountains. It slopes away from the ocean. The lowest part of this land has another kind of soil. It is unlike any other in our homeland.

Think of how a real land basin looks. The San Fernando Valley, you remember, is a basin. But this basin has an outlet. This outlet is the Los Angeles River. A real basin has no outlet. It has a rim of land all about it.

Imperial Valley is a real basin. The land on all sides slopes toward the middle. There is a lake in the lowest part of the basin. We call this lake the Salton Sea. The water of this lake has so much salt and alkali that you cannot drink it. *Alkali* is a salt that is much like the baking soda your mother uses.

Every rivulet carries a tiny amount of salt and alkali. There was not enough water in all the rivulets that flowed into this basin to make the water rise enough to flow over the rim of land. So all the salt and alkali that they carried had to stay there.



Sand dunes cover a strip of the desert between Imperial Valley and the Colorado River. The wind is moving them from the left toward the right. Look at the picture closely and see if you can tell how we know this. The sand buries the creosote bushes that stand in its path. It is difficult keeping an automobile road open across the sand dunes.

The dry air carried away the water of the lake very fast. We have already learned that the salt in water cannot escape with the water particles. So after a time Salton Sea became a real salt lake.

The water of the lake is lower now than it was long ago. The silt of the old lake bottom has so much salt and alkali that plants will not grow in it. If the lake should dry up there would be a bed of salt in the lowest part of the basin.

This lake will help us to understand why the ocean is salty. The ocean is like a great big lake without any outlet. The ocean lies in the lowest hollows or basins of the earth. This is the reason the water tastes so strongly of salt.

You have now learned something about the soil of the different slopes of our homeland. See how many of these slopes you can find near your home. Tell what you can about the soil on each kind of slope. Tell what will grow best in each kind of soil.

THINGS TO TALK ABOUT AND DO

What is the difference between the color of the water that runs off a grassy slope and water that runs from a slope of dirt?

Tell about any little gullies that you have seen made by the rains upon some hillside.

Tell about some mountain stream you have seen and how it differs from a valley stream.

Tell about the great boulders and rounded pieces of rock that lie in the beds of the streams where they come out of the mountains onto the valleys.

How did these boulders get to the places where they are?

Do the streams flow swiftly or slowly where you find boulders?

What kinds of beds do the streams have down in the valleys where they flow very slowly?

Someone who has ridden over the valley boulevard from San Bernardino to Pasadena might tell what he saw where the road crosses the San Gabriel River bridge.

Pupils of different parts of Southern California might tell about streams near their homes.

Tell where our market gardens are. What kind of soil do they have? Are their slopes steep or very gentle?

Imagine a ridge of high land across any one of our valleys. What would the water form above such a ridge? If there was plenty of water flowing into the lake the basin would finally fill up and overflow. Would the water of such a lake be salty or fresh?

If there were not enough water to fill up the basin would the water in the lake remain fresh or would it finally become salt?

In a far-away corner of our land there is a desert basin that has a bed of rock salt. Can you find out why we say *rock salt*? Here there is a cabin made of blocks of rock salt. What would happen to the cabin if it should rain?

Why does the bed of a fresh water lake make better soil than the bed of a salt lake?

NEW OR UNUSUAL WORDS

skeleton

silt

crumbling

swollen

CHAPTER XX

HOW NATURE TRIES TO HOLD THE SOIL ON THE STEEP SLOPES

NATURE has many helpers at work. Some of them build mountains. Others tear mountains down. Some of them help the plants grow. Others make the plants sickly and finally cause them to die.

We have learned how the rocks are crumbling. We have learned how the pull of the earth and the rivulets together carry the pieces down the slopes.

Nature does not want the mountains to be torn down too fast. It would make the world that she has been so long at work upon, rough and barren. Besides, it would spoil some other plans she has. So she tries to cover them with plants. Each kind of plant must have its own place. One must have a great deal of water. Another can get along with a very little. We want to find out now how the plants keep the crumbling rock and soil from washing away.

There is a fire in the mountains. Great clouds of smoke are rising into the sky. The men who take care of the mountains hurry here and there. They must get all the men they can to help fight the fire. If it is not put out at once the fire will do great harm.

There are mountains in sight of every schoolhouse in our homeland. With the help of a field glass you

can see that their slopes are covered with brush or bushes. The oaks and alders are in the canyons out of sight. The great pines are far back on the higher slopes. You can see them rising from the tops of the ridges. No one lives on these slopes. What harm does it do if fire does sweep over them?

Nature has worked hard and long to spread the carpet of vegetation over the slopes. Where they are steep and there is little soil the carpet is thin and the plants are small. We are now learning why she prizes this carpet so highly.



Did you ever imagine that a tree has so many roots as the one in this picture? The soil has been washed away from them by the waves of the lake that you see on the left. Enough of the roots are still in the soil at the right to keep the tree alive. At the left is the stump of an older tree.

Some of you have climbed a mountain slope. You have seen the bare rocks sticking up here and there. You have seen the dark rich soil that has gathered in the hollows between them. You find plants growing wherever their roots can find any soil or even a tiny crack in the rocks into which they can creep. Some of them have such a hard time that they become thorny like desert plants. They scratch your hands and tear your clothes.

Most of the steep slopes are dry. Nature put here



This is a bank by the side of a mountain road. The slope is covered with young fir trees. The bank shows how their roots go down into the rocky soil. Note carefully the network which the roots make. Do you think the rains could wash away the soil on a slope filled with roots as is this one?



The Santa Ana River at the time of a great flood. Note the tents that are partly under the water. The river is flowing swiftly over its sandy bed on its way to the ocean. Just think of how much more land could be used for orchards and gardens if this water were saved. What can we do to hold the water until we can use it?

only those plants that are suited to dry places. They never grow large because there is so little food and drink. We might call them dwarf plants. But some one thought of a better name. They have been named "elfin plants." All these plants together make the "elfin forest." This forest is like the real forest only the plants are small. You have read about the elves. They are the little people that were once thought to live in the forests.

There are many kinds of plants in the elfin forest. Perhaps you already know the chief ones. There one

finds the scrub oak with its acorns, the sage with its sweet-smelling leaves, and flowers which the bees love. There is the manzanita with its red bark and pretty flowers and berries that the bears like. There is the California lilac with its flowers that are blue or white. There is the chamiso with its tiny leaves. There is the sumac with its strong-smelling leaves. And, finally, there is the toyon, or California holly, with its bright red Christmas berries.

In the hollows between the dry slopes there are real trees. Here is the sycamore, the live oak, and, if there is water, the alder also.

The great pines will not grow on the lower slopes. The elfin forest has this all to itself. You will have to climb a mile above the ocean before you come to the pines. Can you tell why this is? Remember what you learned about the rainfall.

The roots of the elfin forest reach down through the soil. They hunt the cracks in the rocks because they find here a little moisture even in summer. Of course they have plenty of water during the winter. But then it is too cold for them to grow.

The tiny roots form a network all through the soil. They hold it from washing away when the rains come. On the top of this soil there is a layer of leaves and dead stems. These supply food for the plants and also help protect the soil from the rain.

The plants supply two things that help hold the soil. On the top there is the layer of crumbling stems and leaves. Underneath is the network of tiny roots.

The leaves and stems catch and hold much of the water of the winter storms. They act like a sponge. They let the water escape slowly so that it has time to sink into the ground. The water that does escape cannot get at the soil. It runs down the slopes almost clear.

The mountain fire has at last been put out. It burned many miles of the elfin forest. Before the fire the mountains were gray in color. They have



Where the Santa Ana River comes out of the mountains into the valley its channel is filled with huge boulders. These have been rolled or carried down by the floods. See how smooth and round they are. They have traveled a long distance and have had their corners worn off. Point out the water in the river. Do you think it is winter or summer?

At what time of the year are the floods that brought the boulders?

now the yellow color of crumbling rocks. They look like the barren mountains we see in the desert. Every living thing is gone—the forest, the birds, the animals.

Wait until the winter storms come and you will then see why people fear mountain fires. You will learn why they fight them so hard.

The forest is gone. The crumbling stems upon the ground are burned. Sometimes the roots also are burned. There is little left to hold the soil.

There is nothing now to keep the raindrops from hastening down the slopes. They dig channels in the earth and carry the material away with them. They load themselves with the finest and most valuable part of the soil.

The rivulets unite to form creeks and the creeks carry this soil down to the river. The water is flowing too swiftly for it to drop its load. Much of it is carried on to the ocean. There it is lost to us.

The fires make the floods worse. They permit the water to come down all at once. When the forest covered the slopes the water came down slowly. The floods sometimes carry away bridges. They sometimes wash out roads and spread sand and rocks over the fields.

Many of you know of the Verdugo Mountains. They lie between the San Fernando Valley and Pasadena. A fire swept over these mountains and burned the elfin forest. The next winter there came a heavy rain. We might call it a cloud-burst. The water ran

down the bare slopes. Torrents swept down the canyons. They flooded the streets of the city in the valley below. They carried mud, sand, and boulders over green lawns. Some houses were almost washed away. Great rocks were carried down as easily by the flood of water as you would carry a pebble. One rock weighing a ton was carried half a mile down a paved street. All this happened because the elfin forest was burned.

Our land is poorer after a great fire in the moun-



You have been learning how rain water washes the soil on the slopes if the carpet of plants is destroyed. Sheep have been pastured on the slope in the picture until almost all the plants that once grew here have been killed. You can see how the water has begun cutting channels.

The top soil is the richest and it will soon be gone.

tains. It will take Nature many years to bring back the forests that have been burned.

But this is not all the harm that fires do. The elfin forest helped to hold the water from running away. This gave the water time to creep down into the cracks in the rocks. It followed these cracks far down into the earth. Then, after a time, it came to other cracks. These led it to the top of the ground again.

Where the water came out of the ground it formed springs. How clear and pure spring water is. A



The bushes that you see in this picture are chamiso. This bush you remember is a part of the elfin forest. It will grow on the poorest and driest soil. The bushes in the picture are growing upon bare rocks that have softened a little so that their roots can get a hold. No other bushes will grow in such places, and so the chamiso has all the room it wants.

drink of it is so refreshing on a warm day. When the elfin forest is burned the springs become smaller. Some of them dry up.

You know that water is the most precious treasure of our homeland. Nature left more than enough for the Indians. There was more than enough for the few Spanish settlers and early Americans. Now that there are so many people, a great deal is needed.

We must not allow any water to be lost. We must do everything we can to save it. We are now storing water behind huge dams in the mountains. We are making lakes larger than any Nature put here. The forests on the mountains will help a great deal if we help Nature take care of them.

The most of the rain comes in winter. Then little is needed for irrigation. The forests help hold it for summer use. Is it not better to keep fire out of the forest than to wait years for it to grow again?

In other parts of the world people have made themselves poor by cutting down their forests. Their rivers have washed the good soil down from the slopes. The floods have destroyed fertile valley land. They have filled up the bays. Where ships once anchored there are now meadows.

Nature is doing her best to hold the soil on the slopes. She used the grass, the small plants, the elfin forest, and the great forest. Each of these does its share in holding the soil. Each helps hold back the water. We must do our share by being very careful about fire in the mountains.

We should never be careless with matches. We should never leave a camp fire burning. We should never burn brush when it is very dry or when a wind is blowing. We should be doubly careful when the north wind blows. This wind brings such dry air that fires will spread more easily.

THINGS TO TALK ABOUT AND DO

Tell about any of the plants of the elfin forest that you know.

In what two ways do crumbling stems and leaves help growing plants?

Crumbling vegetation is *humus*. The gardener likes a soil that has much humus. Humus helps to keep the ground moist. Humus supplies a part of the food of plants. It also helps them to get food from the crumbling rocks. Show this by means of flower pots filled with different kinds of soil.

Pure humus is *peat*. Where you find peat there was once a swamp. There is a peat bed near Los Angeles. Once it caught fire. It was hard work to put out this fire.

Tell about some stream bank or cut in the earth that you have seen. Were there roots in the soil reaching down into the broken rock below?

Roots help break up rocks. Roots of trees sometimes pry great rocks apart.

How can you plant an orchard or garden on a hillside and fix it so the water will not wash the soil away?

Have you ever seen a rotting or crumbling log? How is it like a sponge? What would become of the water if you poured some on a crumbling log?

Where there is much rain the trees are large and the vegetation dense. The ground is deeply covered with humus. Trees

sometimes send out their roots into this humus and not into the ground. When there is a fire and the humus burns, the trees fall to the ground.

What sort of a place is best for a camp fire?

Would you build your fire against a log or where the leaves and dead branches were thick?

In what different ways can you put out a camp fire?

Tell about some mountain fire you have seen.

Why is it our worst forest fires happen when the north wind blows?

Ask your teacher to tell you about cloud-bursts and why they are worse in the desert mountains than in mountains covered with vegetation.

NEW OR UNUSUAL WORDS

valuable doubly refresh dense precious meadow

CHAPTER XXI

HOW NATURE DISTRIBUTED HER PLANTS IN SOUTHERN CALIFORNIA

THE FIRST people from the East reached our land in summer. The sun was hot. Water was scarce. The bushes looked brown and almost dead. Is it any wonder the land did not seem homelike at first?

In the land from which they came there were summer rains. There summer is the growing time. The fields and trees are then fresh and green.

You ask how could anyone think of this pleasant home of ours as a barren land? Shut your eyes and try to imagine how it looked before there were any houses, roads, orchards, and gardens. Think of the great valleys covered only with sagebrush and other wild plants. Think of how far apart the springs were. Think of the rivers of sand with no water in them.

In that Eastern land everything is different. Winter is the resting time for the plants. Then it looks cold and desolate. Summer is the resting time for most of our plants. They go to sleep because the earth becomes too dry for them to get food. In winter and early spring they wake up.

The first people from the East did not know how beautiful our country looks in the spring. They did not know that there was water beneath the sands

over which the winter streams flowed. They did not know that this was Nature's way of saving it. Deep in the gravel and sand the water was safe from the hot sun and thirsty air.

They did not know that there were streams of water in the mountain canyons. Oaks, alders, and willows shade the water from the hot summer sun. They did not know that high in the mountains there were miles of pine forests.

We might imagine that Nature knew the value of



Thousand Palm Canyon upon the border of the Colorado Desert is a wonderful place. Wherever you find palms growing there must be water. The picture shows none on the top of the ground, but the roots of the palms must reach it. There are springs higher up the valley slope. The water creeps down through the sand. Birds may have brought the seeds. Or they may have been washed from places where they were already growing.

trees in this land of ours. We might imagine she put them where it was hard to get at them. Perhaps she knew greedy men were coming who were ignorant of the value of trees. We are now learning to care for the carpet of plants. Our very homes depend upon the care we give this carpet.

The first people from the East did not know how useful the elfin forest is. They thought the slopes on which it grew were just so much waste land. In their far-away Eastern home trees grew everywhere. They used to cut them down and burn them. Gardens could not be planted or farm seeds put in the ground until the trees were out of the way.

The first people from the East knew nothing about irrigation. In their Eastern home the rains usually came often enough to water the crops. But sometimes they failed. Then the crops dried up.

Most of Nature's plants in this land of ours need little water in the summer. Many of them get along without any. The plants we have brought here are used to having water in the summer. Without water they would return us nothing. The most of them would die. Which do you think is better, the way we do or the way the people of the East do?

You have learned that in our land there is every sort of soil and climate. Some slopes have good soil. On others the soil is poor. In some places most of the days are clear. In others there is much fog and many clouds. Some parts are very hot in summer. Others are cold and snowy in winter.



Is not this a beautiful picture? Tell all the different things you can see in it. As we climb the San Gabriel Mountains, the first tree of the pine family that we meet is the big-cone spruce. Is not this a strange place for a Spanish bayonet or yucca? On what sort of slopes do we usually find yuccas? The yucca really loves more water than it can get on dry slopes, as the large one in the picture shows us. The yucca, like the century plant, dies after blooming.

You have learned that the air is cool and often foggy near the ocean. You have learned why this is. The ocean breeze carries the fog far over the land unless there are mountains in the way. Why is the Los Angeles Valley cooler than the San Fernando Valley? Why is the San Bernardino Valley warmer than either of them?

There is a wonderful little valley between Los Angeles and San Diego. This valley is only a few miles from the ocean and yet it is very hot in summer. No ocean fog finds it. The people there make fine raisins, for the air is dry and the grapes are sweet. Maybe you have never seen this valley. But I am sure you can tell why such sweet raisins are made there.

You know that it is cooler on the mountains than in the valleys. Can you tell why this makes more rain fall on the mountains? In what month do most of the wild flowers bloom where you live? Would you find them blooming on a high mountain slope at the same time? Give your reasons for your answer.

Nature does not like to see any bit of earth left bare. She had to supply a different kind of plant for each kind of soil and climate. She had to make more kinds than you can imagine. Each is suited to the place in which we find it.

The most of Nature's plants get along pretty well where she put them. She gives them no care. You have seen how the wild plants crowd each other.

Each strives to get food, water and sunshine. Only the strong ones live.

The plants we brought here with us have to be watched over. Some of them need as much care as little children. We have to soften the earth about them. We have to give them food and drink. We have to see that they get the right amount of sunshine. On cold nights we have to protect some of them.

Plant an orange tree and leave it to take care of itself. Sow your garden seeds and then go off and



How would you like to climb up and sit on the top of a pine tree as this little girl has done? These pines are growing near the top of one of our high mountains. They have a hard struggle to live. Because of the cold and the fierce winds of winter they cannot grow up as their brothers do on the slopes lower down. Note how twisted and gnarled the trunks are.

leave them. What will happen to them? This is the way Nature treats her plants. She sows seed in all kinds of places. Some of these places are very wet. Some are very dry. Some are hot and some are cold. The seeds have no choice of where they will live, as your father and mother have. Neither have they anyone to help them, as your orange tree has.

If the wild seeds do not like the places in which they sprout they may die. Or, they may live and grow but little. Then we say they are *dwarfs*. The tiny oaks of the elfin forest are called "scrub oaks" because they are so small.

Cat-tails, tules, flags, and some grasses grow in marshy places, or at the edge of the water. When white people first came there were marshes between Los Angeles and the ocean.

Salt grass likes a soil with a little salt or alkali. These substances will kill most other plants.

Willows grow in damp places near the water. If you were in the desert and very thirsty and saw a willow far away, what would you do?

Sycamore trees like the rocky beds of the streams and the bottoms of the valleys. In such places they can send their roots down to water.

The live oaks like the shady hillsides or the bottom of the valleys where their roots can reach water.

Alders grow only by the side of running mountain streams.

Nature put the plants of the elfin forest on the dry slopes. Other plants would not live in the poor,

dry soil. The Spanish bayonet is the most beautiful plant of the elfin forest. You have all seen the circles of sharp narrow leaves from which in spring shoot up tall stalks with white flowers. The cactus is another plant of the dry slopes. What do you suppose is the use of the thorns with which it is armed?

The plants of the elfin forest are small because they get so little to eat and drink. These plants have become so used to being starved that they would not grow large if they were well fed and well watered.



What kinds of trees are shown in the picture? This valley is in the San Bernardino Mountains. Do you think it is a high or a low valley? Why? Trees want water, but in the center of the valley there is so much they cannot grow. But grass does like wet places, and so there is a meadow here. In the late spring and summer it is covered with wild flowers. What would you find here in winter?

Why is it that Nature put so few trees in our valleys? Why is it that she put no pine trees there, but tucked them far away in the mountains? Can you tell how it is that we can get pine trees and many other kinds of trees to grow in the valleys?

Nature waters the mountains better than she does the valleys. You can see that the storms are heavier there than where you live. Surely you know why. Nature favors the mountains in another way. She sends down a part of the water from the clouds as snow. The snow melts slowly and lasts for weeks or months. Can you tell on which slope it lasts the longest? Much of the water from the melting snow sinks into the ground. This water helps the springs more than the rains do. Can you give the reason why this is so?

Suppose it is a summer day. The sun shines brightly where you live in the valley. But you can see great thick clouds piling up over the mountains. You see flashes of lightning and hear the thunder. It may rain for many hours. These summer rains help make the pines grow large. They help keep up the flow of the rivers when the farmer needs the water.

You can tell the trees of the pine family by their needlelike leaves and their cones. They do not shed all the needle leaves at once and so they are always green.

There are many kinds of trees in the pine family. Each kind has its own place. Suppose you are going

up a mountain canyon. The first one that you come to is the *big-cone spruce*.

When you have climbed about a mile above the sea you will come to the first real pine forest. This is made up of *yellow pines*. The yellow pine grows tall and straight and is used for lumber.

A little higher and you will come to the *cedar*. You can tell the cedar by the pleasant smell of the wood. Cedar is much used for shingles. Can you tell why?

Going a little farther you get among the *sugar pines*. When a cut is made in this tree a little sweet sap comes out. When this dries it looks and tastes like a kind of sugar. We prize the sugar pine very highly for the lumber it makes.

If the mountain is high enough you will come to other pines. They do not grow as large as the sugar pine. This is because the higher we go the colder and fiercer the winds blow in winter. The pines creep up almost to the top of our highest mountain. This you remember is San Gorgonio or Grayback.

The top of Grayback is bare rock. No trees can grow there. But there are little plants. They grow where the rocks shelter them. These flowers come up when the snow melts in spring. They have beautiful little blossoms. The seeds ripen quickly and then the plants die down to the ground. The seeds and bulbs lie under the snow until spring comes again. They do not have to fight the winter storms.

Suppose you take a real or imaginary automobile

trip from the ocean across the mountains to the desert. Tell all you can about the changes in the plants that you see along the way.

SUGGESTIONS TO THE TEACHER

Most of the children in every class in Southern California have traveled more or less through their home region.

Get as many reports as possible of what different ones have seen in different parts. Ask them to tell especially about the heat and cold, and the plants, both wild and cultivated, that characterize each place.

If any of the children have been in the mountains in a thunderstorm have them tell about it.

Those in the class who have come recently from some Eastern state can help very much in making clear to the others in what way the plants there are unlike those in California. Ask them to tell what parts of California are most like the East.

Using the sand table, show why the valley of Los Angeles is a poor place for making raisins. Show why San Fernando and San Bernardino valleys are better.

Model a little valley close to the ocean but separated from it by mountains. Get the children to tell why this valley has plenty of water. Why does the valley grow very sweet grapes? Why is the valley a good place in which to make raisins?

Why do oak trees do well in the bottom of the valley? Why are the slopes of the mountains around the valley covered with the shrubs of the elfin forest? On the tops of the mountains are oak trees but no pines. Get the children to see that this is because the mountains are not high enough for pines.

NEW OR UNUSUAL WORDS

ignorant breeze strive imaginary

CHAPTER XXII

HOW WE HAVE DISTRIBUTED OUR PLANTS

WE CALL THE PLANTS that Nature spread over the valleys, hills, and mountains *wild plants*. We have learned how she treats them.

Most of the useful plants around our homes and in our gardens and orchards are *tame* or *cultivated plants*. The animals that live with us and are useful to us in so many ways are *tame* or *domestic animals*. They have been brought here from other lands.

Very, very long ago all plants were uncultivated and all animals were wild. All the people who lived on the earth were also wild. They lived upon what Nature supplied them. They got their food as our Indians did.

But some of these wild people wanted to live better. They thought they could improve upon what Nature was doing for them. So they picked out the best of the wild grasses, fruits, nuts, and roots. They carefully tended them. They gave them water and planted them in good soil.

Year after year these early people kept picking out the best seed of the fruits and roots. Year after year these were planted. By and by, after thousands of years, they grew into the wonderful food plants we now enjoy.

We are still improving the plants. You know of

the work of Luther Burbank. He spent his life helping Nature grow prettier flowers and finer grains, fruits, and nuts.

These people of long ago caught the young of wild animals and birds. As these grew up they became tame. They were cared for as were the plants. Always the best were saved.

The jungle fowls became our hens. Small birds that sang prettily were caged so that their songs could be heard in the homes. Now they depend on us. If we turned them out the most of them would die.

The wild cows became our gentle cows and gave us more milk. The wild donkeys and horses became our docile work animals. The wild sheep and goats grew finer and longer wool when they had better food and care.

What would happen if we should leave our tame animals and cultivated plants to the care of Nature? Some would die. Those that lived would become wild again. The flowers would become smaller. The sweet, tender fruits would grow hard and sour. The vegetables would grow small and tough. The nuts would have thicker shells. This is because our care has made them what they are.

We have learned to supply just the right soil and the right amount of water and sunshine that each kind of plant needs. Many of these plants have been brought to our land from other parts of the world. Each year we get new plants. For some of these we cannot find a home like the home they came from.

But Nature has given our land so many kinds of places that we find new homes for many of them.

Some of these plants come from dry lands. They grow here with little care. The prickly pear is one. The eucalyptus and athol trees are others. Some



Banning, you remember, is in the mountain gateway between Los Angeles and Imperial Valley. You also remember that apricots and almonds love its climate and soil. The earliest to bloom of our orchard trees is the almond, as shown in this picture. Note the wonderful mountains in the back of the picture. They form a part of San Geronimo, our highest peak. You can see the snow on their tops. They supply the water that is turned into the furrows between the rows of trees to keep them growing.

come from lands that have cold winters. Are there any spots in our land that such plants like? Some come from very hot, dry lands. Can we find good homes for such plants? Do you think there is any spot in our land where the huckleberry and cranberry would grow?

Some plants came to our homeland by chance. They were brought without our knowing it. Some of them do a great deal of harm. You all know of the Bermuda grass that gets into your lawn. The farmer can tell you of the wild morning-glory that often runs over his fields. We wish all such plants might be destroyed. They belong to the family of *weeds*. They use food, water, and sunshine that are needed by the useful plants.

Some animals, birds, and insects that we do not want have reached our land. The rat came by boat. Tell what you can about the harm the rat does. Why is the English sparrow such a nuisance? How do you think it got here?

Many harmful insects have been carried here by accident. They came clinging to fruits and plants. They found here the fruit trees they liked. And so they have spread through our orchards. Every year they cause great loss of fruit. Can you tell some of the ways in which we fight these insects? You all know the ladybug. This insect is one of our best helpers. We are now trying very hard to keep the bad insects away. Can you tell what we mean by "plant quarantine."



You will find our bee ranches on the gentle slopes in mountain canyons. Can you tell why such places are chosen? The mountain slopes about this ranch have few trees. Can you tell why? Tell, if you can, the one wild bush of the elfin forest from which bees get the most of their honey. Bees fly a long distance. From what valley orchards do they gather much honey? We should use more honey, as it is more healthful than white sugar.

The ants that have been brought here do much harm. They eat fruit and destroy wood. The worst thing they do is to spread other harmful insects. Among these are the *scale* and the *aphides* that injure our flowers, vegetables, and fruit trees. Do you know that the ants are very wise? They take good care of the scale and aphides. They spread them over a tree and carry them from one tree to another. Can you tell why the ants love the scale and aphides? .

The farmer, the fruit grower, and the gardener each chooses with care the land that he is going to plant. He has in mind the soil, the heat or cold, the sunshine, and the water.

The alfalfa farmer picks low flat land. Alfalfa needs much water. It sends its roots far down where the soil is always moist. The vegetable gardener also likes the bottom of the valley. Here the soil is rich and water is easy to get. In what valleys of our land have you seen alfalfa fields? For what purpose is alfalfa grown? Give all the reasons you can to explain why San Fernando and Los Angeles valleys are good places for vegetable gardens.

Some vegetables do not like the hot summer sun. Among them are lettuce, beet, artichoke, and celery. Can you tell why our great bean fields are all near the coast? If you do not know ask some man who raises beans.

Why is lettuce grown in Imperial Valley in winter and near the coast in summer? If you wish to

grow very early cantaloupes, watermelons, and grapes why do you go to Imperial Valley? It will help you in answering this question to know that oranges ripen earlier in Northern California than in Southern California. One would think it ought to be the other way around. The reason for this strange thing is that our valleys get the cool ocean fog. There are no high mountains to cut it off as there are in Northern California. What lies between Imperial Valley and the ocean?

Orange, lemon, and avocado trees do not like cold nights. The fruit and trees are easily injured by



A field of beans somewhere in Southern California. Do you remember why it must be near the ocean? What do you think about its being near the city of Ventura? There is a valley here, large and flat, like the one in the picture.

the frost. You have seen many orange orchards. Are the most of them in the lowest parts of the valleys or are they on the higher land on the slopes of the valleys?

Cold air is heavier than warm air. This makes it sink to the lowest parts of the valleys at night. The man whose orchard is in the bottom of a valley has to light his smudge or oil pots, while the man whose orchard is a little way up the slope does not.

Would you choose land near the coast for growing oranges? Why are the slopes about Riverside, Redlands, and San Bernardino covered with orange orchards? What kind of weather makes the sweetest oranges?

Do you want lemons to be sweet or sour. How



A large field of celery near Long Beach. See how flat the land is. You have learned how the rich soil of this plain was formed beneath the ocean when the land was not as high as it is now. Can you tell what kind of soil and climate celery likes best? Find out if you can why everybody is learning to eat celery.

would coast lands do for lemon orchards? Why do slopes near the coast have the least frost of any slopes in our homeland?

Our first avocado trees came from Mexico and Central America. Do you know which way from us these countries are? Why should these lands have less frost than ours? The avocado tree likes moist air, water, and sunshine that is not too hot. Where in our land are there slopes suited to growing this delicious fruit? The avocado does not like Imperial Valley. Can you tell why this is?

The sun stands overhead in the homeland of the avocado. But it does not get very hot and there is plenty of rain. Can you tell how this can be? Perhaps your teacher will help you.

We brought cherry trees from a land that is cold in winter. The cherry tree will not bear fruit near the coast or in our valleys. The most of our cherries come from Beaumont. Do you remember where this place is? Think of the two twin peaks and the gateway to Imperial Valley between them. This will tell you where the Beaumont country is.

What kinds of apples do you like best? Find out from your fruit dealer where they grow. Find out also the kind of winter climate the place has. Where in our land are there slopes on which the apple tree feels at home? You have all heard of the mountain valley called Yucaipa. How do the apples grown there compare with those grown in some valley near Los Angeles?

The walnut tree does best where the soil is deep. It likes to send its roots down to water. In what parts of our land ought we to find the great walnut groves?

Almond trees prefer drier land, drier air, and a hotter sun than walnuts.

We grow almonds in Antelope Valley. This valley, you know, is on the border of the Mohave Desert. Find out from some one who has been there what kind of a climate Antelope Valley has.

You remember Beaumont in the mountain gateway between the twin peaks. What fruit do we get from there? Follow the highway toward Coachella Valley. The air becomes warmer and drier. Before you know it you are among almond orchards.

We grow many kinds of grapes in our homeland. Do the sweetest kinds come from the cool valleys or from the hot valleys? What kinds are made into raisins? Why do our best raisins come from Fresno?

We all enjoy eating figs. We grow good figs by the ocean. We grow good figs in Imperial Valley. We grow figs in all our valleys. Fig trees do not like cold winters. The cold shuts them out from a part of our land. What part is this?

We have all seen banana palms. Why do these seldom bear fruit? What happens to these palms on frosty nights? Did you ever hear of the sheltered garden in Los Angeles where the banana palm bears its cluster of fruit?

Pineapples have been grown in Hollywood. Why

is this a warm sheltered place? Why do we not make a business of growing pineapples? Where do the pineapples in our markets come from? Can you tell what kind of a climate this place has?

SUGGESTIONS TO THE TEACHER

Using the sand table, model two mountain ranges with a valley between them. Make the range near the ocean in two parts with a wide gap between the parts. We might call this gap the entrance to the Los Angeles Valley from the ocean. Make the other range continuous with several low places. Make a high desert behind the northern part. Call this the Mohave Desert. Make a low place on the east. Call this the Imperial Valley.

Get the children to tell what fruits and vegetables they would grow on the slope next the ocean. Then tell which they would grow on the slopes of the valley between the ranges that are partly sheltered from the ocean winds.

Have them next discuss the fruits they would grow in a high mountain valley.

Many of the children know that pears, apples, and almonds come from the southern slope of the Mohave Desert. This is known as Antelope Valley. Get them to discuss the climate.

Consider next the reasons for the climate of Coachella and Imperial valleys.

THINGS TO TALK ABOUT AND DO

What sort of plants is frost most likely to harm, those that drop their leaves and go to sleep in winter or those that keep their leaves and grow a little through the winter?

Tell of a number of kinds of plants that shed their leaves and a number that do not.

If you were out camping and sought the warmest place you could find at night would you put your tent in the bottom of a valley or a little way up on one side? Why are nights near the ocean warm?

Plant the same kind of seed in two flower pots, giving one poor soil, the other good soil. Give them both the same amount of water.

Plant seed in two other pots, give each the same kind of soil. Give one plenty of water and the other little. Watch them and see if they all grow alike.

If you were hunting a piece of land on which to plant an orange grove, tell all the things that would govern your choice. Would you choose the same kind of place for an avocado grove?

Imperial Valley produces our best grapefruit. Oranges do not do so well. The hot sun injures the oranges. Look carefully at orange and grapefruit trees and see if there is any difference in the way the fruit hangs.

Those who have been where the best apples grow may tell by what road they got there and the kind of climate the place has.

NEW OR UNUSUAL WORDS

tend jungle docile heal advantage nuisance

CHAPTER XXIII

WE COULD NOT GET ALONG WITHOUT THE MOUNTAINS

HERE in our Southern California home we have everything we want. We ought to be the happiest children in the world. But did you ever think how many of our good things we owe to the mountains?

We know the joy of the bright sunshine. The plants and animals love it as much as we do. We have seen how the warm spring rains awaken the plants. We know the value of the soft dark soil.

But we often forget all about the mountains. Perhaps we think of them as being in the way when we want to see friends who live on the other side. They make the road longer and harder. The rough, rocky slopes seem to us just waste land.

To be sure the mountains are pleasant places in which to camp in summer. In winter there is snow-balling and coasting. Are these their only real uses? If the mountains have no other uses, did it pay Nature to make them?

Nature worked long and hard making the mountains. The work of lifting the earth was so hard that sometimes the ground trembled. You know what that means. You have all felt earthquakes.

After Nature had finished lifting the mountains she saw that they were very rough and rocky. So to soften and smooth off the surface she sent the hot

sun to make the rocks expand or grow a little larger. She sent the cold nights to make them grow small again. She sent the rains so that there would be water to fill the tiny cracks. Finally she sent Jack



—Permission Big Pines Recreation Camp.

What a happy time the boys and girls are having coasting or tobogganing. This is a picture of winter sports only a few miles from where winter lettuce is growing in the open air and orange trees are blossoming. Where do you think it can be? You have learned how cold mountains are and how it snows and freezes in winter. If you will go to Big Pines Recreation camp after a snow storm you will see scenes like that in the picture.

Frost to freeze the water. When water freezes it takes a little more room. All these agents or forces of Nature helped to break the rocks in pieces. They finally crumbled and covered the surface with soil.

The mountains were so high that a great deal of rain fell on them. Often it snowed because the air was so cold. Then the rain water began to do something that perhaps Nature had not planned.

The raindrops gathered in rivulets. The rivulets cut little chanel in the soil. The little channels became gullies. The gullies grew to gulches. The gulches at last became canyons. Now the mountains looked worse than they did before. There were sharp ridges of rocks. The canyons between them were deep and narrow. Something must be done.

So Nature scattered the seeds of plants over the rough slopes. Wherever there was a little soil the seeds sprouted and grew. The hardy plants grew first, for the soil was poor. These helped to make the soil better. Then came the more tender plants that needed better soil and more water.

The plants of the elfin forest are hardy. They covered over the dry slopes. The pines spread over the high slopes where there was more rain. The alders grew along the streams. The oaks took to the shady slopes.

Nature has taken so much pains with the mountains that they must be very necessary. Wherever you live in Southern California you can see mountains. They are very close to some of your homes.

They rise high into the sky. They are far away from some of your homes. Perhaps you think little about them.

The mountains rule our lives. It does not matter whether they be near or far. Your comfortable home would not be a home if there were no mountains. You would not live here if our land had no mountains.

A part of our mountains are too steep and rough for people to make homes in them. Other parts



What do you think is happening here? Does it not look as though something was at work breaking this great boulder into pieces? Each of the large pieces is breaking up into smaller pieces. Water and warm sunshine and Jack Frost are slowly doing this work. They are making no noise about it, but year after year they are making the boulder crumble to sand and clay.



You have been learning about how the rocks crumble and make soil. This picture shows the under side of a great boulder. On the ground you can see thin scales of rock that have fallen off the large one. The heat and cold are making it crumble. By and by the little scales will crumble and make sand and clay.

have gentle slopes. They offer pleasant places for homes. They offer good soil for orchards and gardens. But we could not spare any of them.

Water is the most precious thing we have. It is worth more to us than gold mines. It is worth more than our oil wells. Let us suppose we had gold, oil, good soil, warm sunshine, but very little water. Could our land be filled with happy homes as it is now?

In the valleys of most other lands the rains bring enough water. The people living in such valleys do

not have to go to the mountains for more water. But our valleys would be barren without them.

The sun would shine just the same if there were no mountains. The cool ocean winds would bring the fog as it does now. The soil would be as fertile. But if there were no cold mountains there would be little water. The clouds would carry most of their moisture on to some other land where there were mountains. You have already learned how the mountains rob the clouds. Can you tell now how they do this?

If there were no mountains there would be no rivers. Find out all you can about some river that you know. Where does the river begin? Where does the water come from that you see flowing down its channel? Ask some one who has been to the head of the river to tell you about it. Does it start in a valley or in the mountains?

Keep your eyes open and you can learn a great deal yourself about the story of the river.

Let us suppose it is a summer day. The sun is shining brightly over your valley home. The day is warm and great clouds are piling up over the mountains. Now they look like castles, now like huge animals. The clouds become dark underneath. You faintly hear the thunder. Heavy rain is falling upon the high slopes. It may rain there all day.

Let us now suppose it is a winter day. The south wind is beginning to blow. The clouds gather about the mountains and hide them. These are signs that a storm is coming. After a time the clouds cover



Here is a giant tree that was small once like the tree on page 250. Its roots are down in the cracks in the rocks which it has pried or pushed apart. It looks as though it got plenty of food. The weight of the snow made it crooked when it was small, just as it did the small tree on page 250.

your valley also. It begins to rain in the mountains long before any falls in the valley. When at last the storm breaks over the valley and the sun shines again it is still raining in the mountains. It may storm there for a day or two longer.

Hold your hands a foot to a foot and a half apart. That is the depth of the rain that falls in a year around your valley home. Now hold your hands three feet or more apart. That is the amount of rain that falls in the mountains in a year.

Much of the rain that falls where you live runs



A pine seed has found a little soil in a hollow of the rocks. It is sending its roots down into the crack that you see. By and by when it becomes large and strong it may pry the rocks apart. It is crooked because the snow that falls here bent it to one side.



This picture shows a valley in the mountains north of San Diego. Why would you think that the mountains are not very high here? In the bottom of the valley there is a ranch and some good land. But what would you say of the mountain slope on the left? Does it not seem to be covered with great boulders that have rolled down from the top? Point out the huge boulder on the right. This has rolled down from another slope. The servants of Nature are at work here tearing down the mountains.

away quickly. Much of the mountain rain falls as snow. The snow melts slowly. It feeds the springs. The springs feed the river in summer. Remember your glass of ice water and the little water particles on the outside. This will tell you why the mountains get so much rain and snow.

A part of the rain water is lost in the air. We say it *evaporates*. Another part sinks in the ground and feeds the mountain springs. Nature has put thick layers of gravel and sand in the bottom of our val-

leys. These are her storehouses where she keeps the water. We dig wells and pump this water to the top of the ground for our use.

A fourth part of the water flows away to the ocean. You have all seen the muddy torrents after the winter rains. We need all the water we can get. How can we save this flood water? Would great dams in the mountain canyons catch this water? Tell about any such dams that you have seen.

The San Gabriel River has a large basin among high mountains. It gets much rain that is now lost in the ocean. We are soon going to build in this canyon the highest dam in the world.

You can see now how much our mountains are worth. If they were higher and larger they would be worth still more.

But this is not all of the story of the mountains. They have many other uses besides supplying us with water.

The rocky skeleton of our earth holds veins of minerals. In the valleys they are deeply buried beneath the soil. But in the mountains we can see the rocks. There we can get at these minerals and mine them.

Some of the minerals in our mountains are gold, silver, iron, asbestos, and precious stones. Have you seen the pink and green tourmalines? These beautiful stones are used in making jewelry. They are almost as valuable as diamonds.

All the higher slopes are covered with pine for-

ests. You remember why they grow where they do. The tall straight trees would be worth a great deal if we cut them and sawed them into lumber. But they are worth far more to us in another way. We have already learned how they hold the soil and keep the water from flowing away. You have also learned the value of this water.

The mountains make good pasture lands for cattle and sheep. But these animals often do harm to the



The top of a mountain of bare rocks. It was not so very long ago that Nature made this mountain. She has not yet had time to make any soil. Do you see any plants here? By and by the rocks will crumble. Little plants will make a home here first. Perhaps some bird will drop the seed or the wind will carry it here. When there is soil enough bushes will grow. Then after these little plants and insects have made the soil ready, trees will also find a home here.



— Permission Big Pines Recreation Camp.

Winter sport at Big Pines Recreation Camp. Jackson Lake is frozen over and these girls are playing ice hockey. The ice has a little snow on it, or it would be clear like that the ice man brings you. Ice skates are quite unlike roller skates. They are made of steel. The runners are made with sharp edges so that they will take hold of the ice and keep one from slipping.

water supply. They eat off the bushes and grass so that the rain water runs away faster. Because of this very few are permitted on the slopes where our rivers start. You will find more cattle and sheep on the desert slope of the mountains.

We love the mountains as summer playgrounds. We can use them for this purpose and not harm the water supply. But we have to be careful in two ways. Camp fires must be put out. The water must be left clean, for people in the valleys have to drink it.

Each of our large cities now has a playground for its children. Here those who see little of the country most of the year can romp and play and get strong. How they enjoy a camp in the mountains! The air is fragrant with the odor of the pines. The water is pure and cold. It is very delightful to sleep under the stars in the clear, dry air.

Do you think we could get along without the mountains? Must we not do all we can to help Nature take care of them?

THINGS TO TALK ABOUT AND DO

Tell the difference between a plain, a valley, and a canyon. Think of places in your homeland where you have seen each of these.

Why do mountain canyons have water while there is little on the surface in the valleys?

What is the difference between clay, sand, gravel, and boulders?

Tell from what sort of a slope the rain water runs off the fastest.

Can you tell why the San Bernardino Range has larger forests than any other mountains of our land? This range is fifty miles from the ocean.

The Santa Ynez Range is close to the ocean. It has very few pine trees on it. Can you tell why this is?

Why would you have more use for a tent if you were camping on the San Bernardino Mountains than on any others in our land?

Why do men have to be very careful in building dams in the mountain canyons?

The first gold found in California was in the mountains north of San Fernando valley. There was little of it and so people did not get excited.

Why would you look in the mountains for minerals?

Tell why you enjoy camping in the mountains.

Range cattle and sheep were once pastured in our valleys.

Why do we now find them in the poorer mountain lands?

NEW OR UNUSUAL WORDS

tremble scatter hardy gully fragrant

CHAPTER XXIV

HOW WE CAN HELP NATURE TAKE CARE OF THE MOUNTAINS

NATURE is our all-wise Earth Mother. She made the mountains long, long ago. She has watched over them for thousands of years.

She makes the rocks crumble and turn to soil. She spreads the carpet of plants. There are the tiny plants that bloom in the spring and then die. There are the plants of the elfin forest that grow slowly and live many years. They get along with little water and poor soil, so she puts these on the dry slopes.

Nature sends the most rain on the higher slopes. Here she puts the giant trees of the pine family. These trees take a long time to grow. They live hundreds of years. She even found plants for the desert slopes. Here she put the yuccas, sagebrush, greasewood, creosote bush, mesquite, and many kinds of cactuses.

Does Nature need our help in taking care of the mountains? Perhaps this is a foolish question. She has done her work very well. Could *we* make the wonder-mountains with which our land is filled? We would make sorry work of it if we tried. But one thing we know we can do. We can injure them very easily. You have already learned how our farms suffer when the mountains are injured. Let us see

now in what ways we can work with Nature in taking care of the mountains.

Nature has made rules or laws for the mountains. The first is that the carpet of plants she has spread to protect the soil and hold the water must not be destroyed. You know why this covering is so necessary.

The worst enemies of the mountains are thoughtless people. There are some who do not know how to behave when they visit the mountains. They were not taught when they were children how valuable the mountains are. They were not taught that the carpet of plants must be left as Nature spread it. They cut down young trees just for fun. These trees would some time grow up and help hold the soil. They leave camp fires burning. Should there come a gust of wind the live coals might be carried into dry grass or brush. From these it might spread to the forest.

Thoughtless children gather armfuls of wildflowers. A handful would do just as well. Next year there will be fewer seeds to sprout and bloom again.

Many men smoke pipes or cigarettes. They think they must take these with them into the mountains. A thoughtless one lights a pipe or cigarette and throws the match by the road or trail. He does not look to see if it has gone out. This match may start a fire and soon a whole mountain side may be ablaze. It sometimes takes days to put out such a fire.

Tell from what you have already learned what



This picture shows some members of a camping party on a slope of the San Gabriel Mountains. The bushes hide the horses on which the girls are sitting. In the middle you can see a partly burned stub of a tree. What does this mean? It is all that there is left to tell us there was once a pine forest here. Fire swept up the slope and killed everything. The elfin forest finally grew up and took the place of the pine forest. The elfin forest is much better than no carpet for the slope, but it is not as good as the pine forest.

happens to the burned slopes when the winter rains come. How does such a fire injure the gardeners and fruit growers in the valley below? It will take Nature many years to clothe the slopes again with vegetation.

Nature has given us a beautiful world. We ought to know how to take care of it. Would it not be a good plan to make all those who wish to go into the mountains first go to a nature school? There they could be taught how to take care of themselves. There they could be taught how to help Nature take care of the mountains and make them more valuable to us than they are now.

Men who have cattle and sheep like to pasture them in the mountains. If there are many of these animals they injure the carpet of plants. They eat the grass down close to the ground. Their feet crush the roots into the soft earth of the meadows. They break down and kill the little trees. If let alone these little trees would by and by become a part of the forest.

You know what will happen when the winter rains come. Nature's smooth carpet is partly gone. The water will have a better chance to get at the soil. It will gather in larger rivulets. It will run off more quickly. Earth and pebbles and boulders will be washed down into the canyons. This is a real picture of what happened years ago in the San Gabriel or Sierra Madre Mountains. Now few cattle are permitted in these mountains. Nature is healing the

wounds that were made by the cattle. But it takes her a long, long time.

The wild creatures once wandered everywhere over our land. There were many of them and there were few Indians and white people. These people hunted for food. There was no danger of killing all the wild game. The mountains are now the last home of these creatures with which Nature had filled our land. They have no other place to hide away from the greedy hunters. No one now needs the wild ani-



This is a pine forest in the San Gabriel Mountains. Do you see any signs of fire having been here? Have the lumbermen been here? The most of the trees are yellow pines. On the right is one with a different bark. This is a cedar. Find out the different uses to which pine and cedar are put. Do the trees here look thrifty and happy? Compare them with the unhappy pine on page 189.

mals and birds for food. There is plenty of other food. Men now hunt for pleasure. We call them sportsmen. They put out decoys for the ducks. They hunt with powerful guns that kill many birds at one shot. They take an unfair advantage of the wild creatures. Do you not think it dreadful? Do you not think it cruel to take pleasure in killing animals?

Why not let the wild creatures live and enjoy their lives? They have as much right to do so as we have. The most of them are harmless. They add beauty and interest to the world Nature gave us.



This is a mountain forest where everything is just as Nature made it. Find the great trees, the crumbling or rotting stump, and the rotting logs lying on the ground. Do you not think that this crumbling vegetation makes a fine sponge for holding rain water? The water that runs away from this forest will be clear, for it cannot get at the soil.



Can you tell what the small plants are in this picture? Would you think this is a wet slope or a dry slope? Give your reasons. With what does the ground appear to be covered? Do you think the surface of the ground is a good sponge or a poor one? Does most of the rain that falls here soak into the ground or flow away? Would a fire do much harm to this slope?

We are now trying to save the wild game that is left. To do this we pick out wild places as *refuges* for the animals. We pick out swamps and lakes where water birds feed and nest as *sanctuaries*. All hunting is forbidden in these places.

No one may hunt on the steep slopes around San Antonio Peak or "Old Baldy." Here you may get a sight of a small band of mountain sheep. These are all that are left of the many that once lived on

our mountains. The high slopes of San Jacinto and San Geronimo are also game preserves.

Nature has one unruly servant. This is the lightning. You have all seen zigzag chains of lightning. They dart from the dark thunder clouds down to the earth. If rain is falling where the lightning strikes no harm is done.

If the lightning strikes a dry log in the midst of dry brush it may start a fire. Then if no rain comes the mountain side will soon be all ablaze. Forest rangers are on the watch for such fires. If they can get to the place quickly enough they will be able to put it out. In this way we may do much to help Nature.

Another way we can help Nature is by cutting *fire lines* through the elfin forest. You have seen the bands of bare earth that wind here and there up the mountain slopes. These are fire lines. A fire can often be stopped by such strips of bare earth. If a strong wind is blowing the fire may jump across these strips.

Our chief mountains are now *national forests*. By this we mean that the government at Washington has charge of them. Men called "forest rangers" patrol them through the summer. When there is no danger of fire the rangers spend their time making trails. Trails are needed by visitors and campers. Trails help the rangers reach a fire more quickly. The elfin forest is so thick that it is very hard and slow work to climb through it.

The rangers have placed lookout stations on some of the high peaks. From these they can see for many miles in every direction. If they see smoke in a far-away canyon they telephone to the central office. From there men are sent as quickly as possible. In this way fires are often put out before they have done much harm.

The rangers decide how many cattle and sheep may be pastured in the national forests. None are permitted where they would do harm to the plant cover. The rangers also watch over the hunting. They see that men obey the game laws. In the parks there must be no hunting. There everything is left as Nature made it.



These men are planting young pine trees on a mountain slope. You can see that the slope is made of crumbled rock which has not yet become good soil. The men are helping Nature start a forest.

There are many slopes on which Nature once grew pine forests. Now only partly burned stumps are left. Fire left the soil poorer. The slopes dried out more quickly. Can you tell why? The pine trees could not again get a start. And so Nature covered them with the elfin forest.

We can help Nature clothe these slopes again if we supply her with the trees.



This is a high valley on the San Gabriel Mountains at the head of the Tujunga River. A fire has swept away the forest that once covered all the slopes of the picture. Near by is a tree killed by the fire. Farther away are a few trees that escaped it. The elfin forest has taken the place of the pine forest. The sun and thirsty air now get at the water of the river and dry up much of it before it can reach the San Fernando Valley and creep down through the sand to help supply Los Angeles.

Near Pasadena, at the foot of the Sierra Madre Mountains, there are nurseries. Here many thousands of young pine trees are growing. When they are old enough to take care of themselves they will be planted on the mountain slopes that need them. If we can keep the fires away they will, after a time, take the place of the elfin forest.

There is still another way in which we are hoping to help Nature take care of the mountains. Men are searching for trees that will grow on slopes that are too dry for our pines. If they find such trees they will gather seed and plant it in the nurseries. In this way we may be able to make forest trees grow where Nature could grow only the elfin forest. Can you tell why forests of real trees are more valuable both to the mountains and to us than the elfin forest?

If we take good care of the mountains our land will remain beautiful and fertile. If we are careless in our treatment of them Nature will punish us. This has happened to thoughtless people in other lands.

SUGGESTIONS TO THE TEACHER

Many of the children, while not yet old enough to become members of the Boy Scouts or the Camp Fire Girls, do know something of what these organizations teach and of their outings in the mountains. The class might discuss such topics as the following:

1. The best way to make and put out a camp fire.
2. The harm of wantonly destroying the flowers and the young trees.

3. Protection we owe to the birds and animals.
4. The value to health of living out of doors.
5. The necessity of keeping the water of the mountain streams clean.
6. The possible harm of carelessness with matches.
7. How to keep from getting lost in the mountains.

Collect pictures showing the work of the rain water where the natural cover has been injured.

Pictures of burned slopes are valuable for discussion. There are many such slopes showing partly burned trees and the elfin forest grown up among them.

Show the children why it is that after a fire in the real forest, or where the lumbermen have cut everything and then burned over the surface, a new forest does not at once spring up. The fire burns the humus in the top of the soil. This makes the soil so poor that few seeds except weeds and those of the elfin forest will at once spring up.

After many years the decaying leaves and stems of the elfin forest enrich the soil and keep it moist enough that the seeds of trees, if they are carried there, will sprout and grow.

Discuss with the children how Nature distributes seeds.

Tell the children about some of the troubles that have come upon the Chinese, who have cut down almost all their forests.

NEW OR UNUSUAL WORDS

watch	injure	necessary	thoughtless	vegetation
	rivulet	greedy	ablaze	decoy

CHAPTER XXV

THE OCEAN

DESERT, mountain, valley, ocean—just think how much we can see in one day's ride across our homeland.

Think how many kinds of places there are in which people live.

Think of the many kinds of climate and products.

Think of the many kinds of work people are doing.

We will start in the morning where the sun shines almost every day. In summer it is burning hot. Before noon we are on a high mountain top. Here there are cold storms and snow more than half the year. In the afternoon we are down in a valley at the foot of the mountain. Here there is sunshine and warm rain. By evening we have reached the ocean. Here cool winds blow. There is sunshine, cloud, and fog. This sounds like a fairy story. But is it not all true?

This part of the story is to be about the ocean. The ocean is the great highway that Nature had all ready for us. It does not have to be built, for ships can go anywhere on it. All they have to look out for are the storms, the shallow places, and the reefs.

We put our automobiles in garages at night for safe keeping. Ships also must have places in which to anchor where they are safe from storms. And so

we look for bays or harbors. If there is none where we very much need one we go to work and make one.

Men who have studied tell us this ocean is the largest water basin in the whole world. We are ready to believe them for we think they know. There is another shore somewhere with people living on it. Some of these people come to San Diego and San Pedro in ships. They bring products of those far lands and take our products back with them.

When Nature got ready to arrange the ocean and the land, she found it could be done in one of two ways. She could make a shore with bays that reached far into the land. But to do that she would have to cover the land with mountains.

Or, she could make an even shore with miles and miles of sandy beaches and rocky headlands between them. If she did this there would be no bays. But back of the shore there would be fertile lowlands stretching away to far mountains.

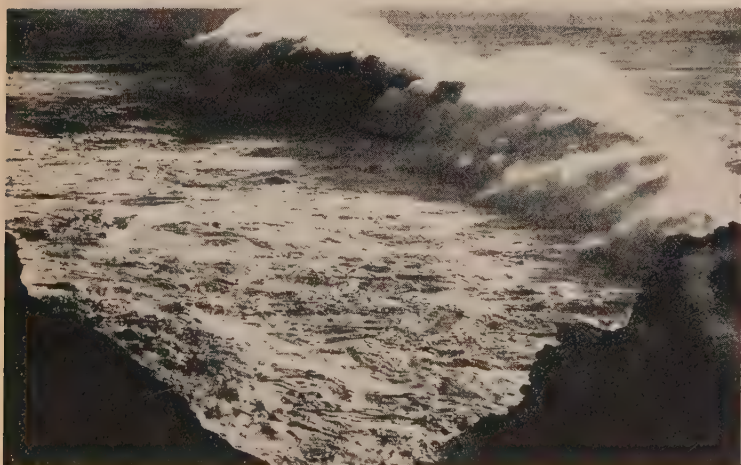
Which way did Nature choose? Was it not the second one? If people ever came, this coast would give them good land. But there would be no places in which their ships could load and unload in safety.

So Nature kept on at work. She caused the land to sink a little so that the ocean would flow over the lowest parts. In this way the Bay of San Diego was made. The higher land in front of the bay formed the island of Point Loma. The waves made Coronado into a peninsula by a sand beach.

The San Diego River brought down much mud

and sand and dropped them near the north end of the bay. Finally the mud and sand built land out to the island. Now we have the main bay that ships enter, the small shallow False Bay and the peninsula of Point Loma.

The sinking of the land made other bays. One was at the mouth of the Santa Ana River. This was small and shallow. The river brought so much sand and mud that the bay is now almost filled up. The waves threw up a sand beach in front of the bay. This is the story of the Newport-Balboa Beach and the bay



Did you ever see a larger wave than this? Somewhere, perhaps many hundreds of miles away, there has been a great storm. What do you think of the force with which such waves strike the cliffs? Do you wonder that the rocks are broken down and ground to sand and mud?

behind it. Perhaps at some time we shall deepen this bay and make a good harbor for great ships.

Another little bay was made by the sinking of the land at the mouth of the Los Angeles River. Nature put Deadman's Island in front of this bay to protect it from the waves. But it was so shallow the river soon almost filled it up.

We have now made a fine deep harbor here by digging the mud and sand out of the shallow bay. This is the Inner Harbor. We have built a great breakwater out into the ocean. This makes the Outer Harbor.

Nature tried to make another bay at the mouth of the Santa Clara River. But this river, like the others, has been very busy. It has brought down so much mud and sand that the bay is now all filled up. In place of a bay we find a vast fertile valley. Here grow fine crops of beans and sugar beets. The soil is just what these vegetables like. The ocean breeze brings the fog that shades them from the hot sun.

Away out in the ocean is the Island of Santa Catalina. It looks like a mountain rising out of the water. Why is this island such a pleasant place to visit in summer? Someone who has been at Avalon might tell the others about it.

Far out beyond Catalina is the Island of San Clemente. This island is used as a pasture for sheep and goats. Why is it that sheep do better here than cattle? Find out what you can about the needs of these animals.

We can see the Channel Islands from Ventura and Santa Barbara. These islands look like a string of mountains partly buried in the ocean. Their slopes are steep. There are few springs. They are covered with the shrubs or brush of the elfin forest. For what do you think these islands might be used?

The Channel Islands have a wonderful story to tell. Long, long ago elephants, tigers, and other strange animals lived in California. The islands were then a part of the mainland.



Some of you have been out to Catalina on a little steamer that landed you at Avalon. Many people go to Catalina for their summer vacation. They enjoy bathing, climbing the hills, and seeing the wonders of the ocean bottom from the glass-bottomed boat. Catalina is very mountainous. Does it look as though you could do any farming here? The slopes are covered with the elfin forest and a few small oaks. What are the trees in the front of the picture? Did men or Nature put them here?

Finally the land sank. The ocean water flowed over the lowland between the islands and Santa Barbara. The animals were caught there, and after a time died. We know that this is true because we have found their bones on the Island of Santa Rosa.

Let us now visit a bit of the rocky shore. We shall find many interesting things. We shall see the waves at work, for they never rest. Somewhere on the ocean there are always storms. Waves made by the winds travel many, many miles.

The rivers of our land carry little water to the



You have learned how the waves are at work tearing down the rocks of the shore. Find the natural bridge which they have made. Point out the layer of dark soil at the top of the cliff. This is a part of the fertile plain shown in the farthest land.

ocean except after the winter storms. You have learned how we are trying to save all of it. But many great rivers flow into the ocean from other lands. Some of these rivers are so wide you cannot see across them. Think of how much water they must carry to the ocean. Yet the ocean never becomes any higher. Can you tell why this is?

Think of what you learned of the clouds and where they come from. Let someone tell the story of a raindrop. Begin with its leaving the ocean; follow it on its journey; and finally bring it back to the ocean again.

We have learned of the work of raindrops and rills. The ocean waves are also at work. Do you know of any places on the shore where there are great rock cliffs? At Point Loma and the Palos Verdes Hills there are deep caves made by the waves. You can enter some of these caves at low tide. The bottoms of the caves are covered with pebbles and boulders. The waves pick up the pebbles and throw them against the sides of the caves. In this way the caves are made larger.

The sun and the air and the rain water are softening the rocks of the cliffs. The waves strike the cliffs very hard. They tear away pieces of the cliffs. These pieces are thrown about and rolled over and over on the bottom. They are finally made into sand and mud. The sand is carried into the bays. The waves use the sand to make the beautiful beaches. The very fine particles of the rock are *mud* or *silt*. They

are carried out to deep, quiet water. Then they sink to the bottom.

The waves do the most of their work at high tide. Then they can reach the upper part of the cliff. Here the rocks are softer. What do we mean by "high tide"?

Have you ever watched the water slowly creeping up the beach? Have you ever watched it slowly going down? It rises twice a day and falls twice a day. Can you tell how long it is in going each way? Is it high tide at the same time every day? Watch sometime and see if the tide follows the moon. Perhaps the moon has something to do with it.

The fine mud that the waves make is spread far out over the floor of the ocean. There it is mixed with the mud that the rivers bring down from the mountains. This soft layer upon the floor or bottom of the ocean is called *ooze*.

If you could see some of the ooze you would find many things in it. There are little shells. There are the scales and bones of fish and parts of other animals that have died. These all sink to the bottom and are covered with the ooze.

The floor of the ocean is smooth. There are no little gullies like those the rivulets make. What rich garden land it would be. It has just the food that plants need.

We have already learned that long before people came, a part of the ocean floor was dry land. Think of being able to walk or to ride in your automobile

out to Catalina and the Channel Islands. The smooth earth, rich in plant food, would grow food for thousands of people. There would be miles and miles of gardens, orchards, vineyards, and alfalfa fields.

At another time, long before people came, the land of our Southern home was lower than it is now. The blue ocean covered all the valleys. If you were on a mountain and could look down on the fog you could imagine how the old ocean looked. The land where our cities now stand was then under water. The Los



Here are caves and natural bridges made by the ocean waves. They have worn holes through a point of rocks that sticks out into the ocean. The tide was down when the picture was taken and the waves are not doing any work.

Angeles and San Bernardino valleys made one great bay. The Palos Verdes Hills were an island. Do you know that there are cliffs that were made by ocean waves near the top of these hills?

You have all played at seesaw. The ocean and the land have played the same game. How glad we are that Mother Nature has left us a part of the old ocean floor! What would we have done if our valleys had been left under the ocean? There would have been little orchard or garden land. There would have been no oil fields. There would have been no City of Los Angeles.



This picture shows you how the waves make islands. Where the rocks are soft they tear them down and make bays. See the beautiful smooth sandy beach in the bay. Where the rocks are hard the waves cannot work so fast. Rocky points are left that are dangerous for ships.

We would be happier still if the dry land reached out to Catalina and the Channel Islands. There might be larger and better bays than any we now have. There could be grown much more food than we can now grow. We could take care of many more people. But there would be no beautiful Avalon to visit on summer days. There would be no glass-bottomed boats and coral gardens.

At last the ocean came back to where it is now. It made Catalina an island again. It made the Channel Islands. It buried under its waters a part of the lowland. Do you not think it left enough for us? Perhaps if we had more lowland we might not have water enough. We would need more mountains and higher mountains to collect water for use on the lowlands.

SUGGESTIONS TO THE TEACHER

Using the sand table, make a long narrow plain with the ocean on one side. Show a smooth and even coast line, because the land is a plain.

Now model another coast line with mountain ranges on an angle with the shore. Where the hard rocks of the mountains meet the ocean there will be a headland or cape. Then show what would happen if the land should sink. The ocean would flood the land far up the valleys, while the shore would change but little where the headlands are. This would form a deeply indented or broken shore with many bays.

Make an imaginary model of the geography of Southern California if the ocean were twelve hundred feet higher. The highest wave-cut cliff on the Palos Verdes Hills is now twelve hundred feet above the ocean.

Discuss with the children how this would change the occupations of our land. Would there be any garden land left? Where would we have to go for our garden produce? The ocean would extend inland beyond San Bernardino and Riverside. Imperial Valley would be under the Gulf of California, but the Mohave Desert would remain land.

Show how the land would be increased if it should rise so as to throw the shore outside of Catalina and the Channel Islands. Get the children to discuss the effect such a change would have upon farming and upon the number of people that could live here.

If the farm land were of greater extent more water would be needed. The children have learned how mountains supply water. Get them to discuss what Nature could have done to supply more water.

Draw from the children descriptions of any visits they have made to rocky portions of the coast. Get them to tell all they can about the waves.

Pictures can be obtained of the ocean cliffs at different points showing the work of the waves.

Explain fully how or why little bays were formed at the mouths of the rivers when the land sank a little. Also how the waves make the bars in front of these bays so that it is difficult for boats to enter. Discuss also the work of the rivers, taking up particularly some river that they know.

Get a picture of a dredger at work. This will show how a good harbor has been made out of what was once a poor one at San Pedro.

NEW OR UNUSUAL WORDS

arrange peninsula pebble boulder

CHAPTER XXVI

THE LIVING THINGS OF THE OCEAN SHORE

DID YOU EVER have a happier time than when wandering along the beach and over the rocks? With arms and feet bare you are ready for any kind of adventure.

When the tide is out you can see a little of that wonderful region beneath the ocean. There, we are told, many queer and strange creatures live. From a glass-bottomed boat you can look down into this enchanted land. Everything is so unlike what we see on the land upon which we live. There are fish and seaweeds of every color. There are curious floating and creeping things, beautiful shells and corals.

Do you want to know why the ocean rises and falls twice a day? Perhaps the sun or the moon can answer you. They are always pulling at the earth. The water pulls more easily than does the land. This pull makes the *tides*.

Most of the animals and plants of the ocean live in the shallow water near the shore. We shall soon find out why this is. When the tide is *down* or *out* many of them are above the water. When the tide is *high* or *in* they are all covered.

Although salt water is their real home, some of them get along very nicely if the water covers them

only a part of the time. If the cool salt water did not come back in a few hours they would all die.

Why is it that you find more living things upon a rocky shore than upon a sandy shore? This is because the most of them must have rock to take hold of. They cannot fasten themselves to the loose sand. They would be thrown about by the waves and killed. Because of this, few living creatures make their homes in the sand.

Each kind of land plant and land animal has its own home. Plants must grow where the seeds fall and sprout. They get their food from the soil.



Here is an ocean cliff in which the waves have worn caves. It is now high tide and the water is flowing into one of them. Point this one out in the picture. Above this cave there is another one which the waves do not now reach. It looks as though the ocean had gone down or the land had risen. Which do you think has happened?

Land animals can move about. They can go to a better place if they do not find enough food where they are.

Sea plants grow fast to the rocks. They get their food from the water. Some of the sea animals are free. They can go where they wish for their food. Some sea animals float about in the water while they are young. But before they are fully grown they fasten themselves to something solid. Here they have to stay all the rest of their lives. They must get their food as it floats by them in the water. Can you tell about some of the sea animals that go where they please all their lives? Can you mention two kinds that we often use for food that fasten themselves to something solid?

Some of the fish live upon other live fish. Can you name any of these? Some seek their food near the surface of the water. Others live far down where the water is hundreds of feet deep. The deep-water fish cannot live near the surface. They are dead before the fishermen can get them to the top of the water.

Some fish eat the dead and decaying bodies of other animals. Among these are the flounder and halibut. They spend all of their lives upon a sandy bottom. The sting ray lives upon the muddy bottom of quiet bays. When we bathe in such places we have to be very careful about stepping upon them. This fish has a long tail with a sharp spike at the end, which makes a bad wound if one is struck by it.

The surf fish live where the waves break upon a sandy beach. Here they find their food. If you were going to fish for rock cod, where would you go? Where do you find the herring and smelt?

Where would you look for the octopus or squid? This animal is often called the "devil fish." Would it be found upon the sandy ocean floor or among the rocks? Have you ever seen a sea lion and heard it bellow or roar? Where does this animal make its home? Where do the seals live that supply valuable furs? Why is it the whale cannot stay long under water? In what way are the whale, the seal, and the sea lion like land animals? Do you know that there are fish that can live for a time out of the water? They come out on the land and even climb trees.

Have you ever seen the fish in an aquarium swimming around with their noses at the top of the water? This is because some one has forgotten to stir the water. The fish are in danger of choking because they cannot get the air they need. Ocean creatures need air as well as those that live on the land.

The sandy beach is the best place to play. But the shells the waves throw up there are dead and broken. Look closely and you may find some live ones buried in the sand. Their home is in the sand, not on the top of it. There the waves cannot injure them.

The market clam hunter knows where they live. He knows too well, for he has dug out nearly all of them. Some of the clams are no larger than your

finger nail. Others are larger than your open hand. You will find oysters only in the shallow water of a quiet bay. When they are young they float. As they grow they finally fasten themselves to sticks or pieces of rock. Long ago there were giant oysters. One would make a meal, for it had a shell about a foot long.

There is a funny little crayfish that lives in the sand where the waves are breaking. You will have to dig very quickly to get one. Drop it and in less



These are the famous La Jolla Caves where you can see the goldfish swimming about. Some spots in the rocky cliffs were softer than Others. The waves found these soft spots and made a cave where each one was.

than a second it will bury itself once again deep in the sand.

The tiny bright-colored fan shells and snail shells that you find on the beach do not live there. Can you guess where they come from? Look far out on the ocean. You will see the *kelp* floating lazily upon the waves. Kelp is a kind of seaweed. It is gathered and burned. The ashes contain valuable minerals.

The kelp is tied to the rocky bottom by a long stem. The stem is round like a cord and very strong. Let us take a little boat and visit the kelp. You will find it the happy home of many kinds of living things.

Upon the kelp are both plants and animals. They are all living in a world by themselves. Delicate little seaweeds and barnacles are fastened to the kelp. The pink fan shells grow on it in clusters. Periwinkles creep about with their shells on their backs. There are little crabs with seaweed and barnacles growing on their backs. If you look carefully you will find other curious creatures that make their home on the kelp. A good home it is unless some storm breaks the kelp loose from the bottom. Then the kelp, and its once happy family, wash up onto the beach.

Let us now visit a rocky shore. Here is the home of ever so many kinds of living things. It will take us many hours to find out all about them.

There are many kinds of land plants and animals in our Southern California home. This is because there are many kinds of places in which they can

live. A rocky shore also has many kinds of places for the animals and plants of the ocean. Each place has its own creatures.

There are bold rocks where the waves break fiercely. There are channels where the water flows swiftly. There are deep, narrow cracks and caves where creatures can hide in safety. There are quiet pools or basins. Many of these the waves do not reach at low tide. Many happy hours can be spent in watching the home life of the living things in these quiet pools.

Suppose you choose a pool for study. About its sides are coral growths of many colors. Anemonies or sea flowers cling here and there. Their tentacles or arms are like the petals of flowers. They are spread wide and wave gently in the water. If you drop a little shell in the center of one the arms quickly close over it. This is the way the animal gets its food.

In the bottom of the pool there are sea urchins with their long purplish spines. There are starfish with their five arms. There are also tiny fish of strange shape and color. Robber crabs creep about. They carry on their backs stolen shells. Each quickly draws into its shell if disturbed.

The abalone with its beautiful shell lives in the cracks of the rocks through which the waves sweep. They cling very tightly when disturbed. They have been hunted both for their shells and for their flesh. They are now protected by law.

The funniest creature to be found at low tide is the rock crab. As you come near, countless numbers of these little crabs scamper for safety to some crack. Each holds out a great claw as though begging for mercy.

Fish that are used for food live in the nooks between rocky points. In such places you may see a small squid or devil fish. This animal has a soft round body and long tentacles or arms. Each arm has rows of cups with which the animal grabs and holds its food.

Why is it that most of the sea animals and plants



The tide is out and the waves are doing no work. What curious shapes the great storm waves have cut out of the rocks! Some look like tall chimneys. The sand you see is made out of the ground-up rocks.

live in shallow water near the shore? One reason is that there is more food near the shore. You will always find more living creatures where there is plenty of food than where there is little food. Give all the reasons you can think of why there is the most food near the shore.

Most fish lay their eggs in shallow water. Some of the sea fish go up the rivers to lay their eggs. Could salmon use our Southern California rivers for this purpose?

Out in the ocean there are shallow places called *shoals* or *reefs*. Great numbers of fish are always found in such places. This is why fishermen say that reefs are the best fishing grounds.

There are four reasons why more fish are found in shallow water than in deep water. There is the most food in shallow water. Shallow water is the best place in which to lay their eggs. Shallow water has more air in it.

The last reason is that fish must have sunshine or sunlight. The light of the sun does not go very far down into the water. In very deep water it is always dark as night. There are some wonderful creatures that live in the deep, dark parts of the ocean. Perhaps you have seen pictures of them. They carry their lights around with them.

Perhaps some time you will journey far to the south where the water is warm. There you will see many kinds of beautiful coral, brilliant shells, and bright-colored fish. Could you look down into a

coral grove, you would think you were in an enchanted land.

SUGGESTIONS TO THE TEACHER

An important lesson to be learned from this chapter is that the living things of the ocean need food, air, and sunlight as much as do land animals and plants.

The ocean animals differ from those upon the land in that nearly all their food is flesh food, though some of them eat small quantities of seaweed.

The ocean plants differ from those upon the land in that they do not get their food through roots that go down in soil, but take it from the water.

Another lesson is that while a part of the animals are free to move about in search of food, as do the land animals, others become fastened to the rocks as they grow up.

Another lesson is that some of the animals can live in fresh as well as salt water. Also that some land plants grow in mud or sand in quiet salt water close to shore. They get their food through their roots, as do land plants.

An interesting topic for discussion is the difference between whales, seals, sea lions, and some other mammals, and true fish, and in what ways the mammals resemble land animals.

A very important lesson is that of the need of conservation of sea life. The pupils will be inclined to think that the laws to protect the animals of the ocean, especially edible fish, are unnecessary because they have the whole ocean in which to live and can easily keep away from the fishermen.

The pupils should be shown that the most of the edible fish must make their homes in shallow water in order to get food and have a place in which to lay their eggs. They also need sunlight and air and these are to be had in sufficient quantities only near the surface.

The common edible varieties of fish must then be protected or they will be exterminated as easily as the land animals and birds.

These considerations will lead the children to see the necessity for the protection of the fish in the streams. The most of our streams are small. The fish must be protected a part of the year and artificially hatched young ones supplied or soon there will be no fish.

NEW OR UNUSUAL WORDS

region	enchant	solid	surface	mineral	delicate
barnacle	tentacles	fiercely	spike	growth	brilliant

CHAPTER XXVII

THE DESERT

WE HAVE LEARNED that our land is a little world all in itself. We could get along very well without the rest of the great world.

Mountains break up our land into many kinds of slopes. Each slope has its own soil. Each has its own climate. Each has its own plants.

Because of these things there are many kinds of products. There are many kinds of work carried on. Where in the whole world can you find so much in a country as small as ours?

Our land is like the roof of a house. It has two chief slopes. One side slopes toward the ocean. This is the side we have been studying. The slope toward the ocean is the longer one. The ocean slope gets nearly all the rain. The most of us live on this slope.

The other slope is away from the ocean. It gets little rain. For this reason we call it a *desert*. But is it a real desert? It is covered with many kinds of bushes. All plants, as well as the animals that live among them, must have water. A real desert has no living thing because it has no rain. Would it not be better to call this dry slope of ours "The Land of Little Rain"?

Once people feared this desert. Some of them died of heat and thirst trying to cross it. They thought

it was all worthless rock and sand. Now we prize the desert as much as any part of our land.

Are not mountains strange things? We have learned how dry our land would be without them. We have learned how they cause the rain. We have learned how the rains make the rivers. The rivers bring us water for our orchards and gardens.



This picture shows how Coachella Valley looked when people first found water in wells and began to make their homes there. Look carefully at those rugged mountains in the back of the picture. This is the great mountain wall that makes this land a desert. You have learned how this wall cuts off the storms from the ocean.

The mountains bring life to the slope toward the ocean. But at the same time they cut off the clouds and the rains from the slope away from the ocean. Is not this very interesting?

It is of the desert or "The Land of Little Rain" that we are now going to learn. Let us find out first how to reach the desert. You remember we cannot make roads where we please. We have first to take account of the mountains.

Happily for us Nature has left passes or gateways between all the valleys and slopes of our land.

You remember we have already talked about the mountain gates through which people pass in coming to Los Angeles. There is one eastward from San Bernardino that opens from the Colorado Desert. There is another north of San Bernardino that opens from the Mohave Desert. To the north of Los Angeles there are two gates that open from the Mohave Desert. The third gateway is to the northwest. This is near the ocean. It is the only gateway that does not open from a desert. Do you not think we ought to know all about these deserts, because we have so much to do with them?

Let us look first at that part of "The Land of Little Rain" that was once called the Colorado Desert. Over smooth highways we go from Los Angeles to either Riverside or San Bernardino and Redlands. Now we begin to go up long gentle slopes. We soon leave the orange orchards. Can you tell why? We pass through cherry and apple orchards to Beau-



You are looking at a mountain of bare granite rocks in the Mojave Desert. What do you see near the bottom of the picture? What do you suppose the horse is doing here in the desert? Close to the tree there is a spring that all travelers in this part of the desert know about.

Springs in the desert are precious things.

mont. Here we are in the center of the San Geronio Pass, or gate. On either side rise the great twin peaks that we already know. Now we begin to go down hill. We leave the cherry and apple orchards and come to almond and apricot orchards and the town of Banning.

Beyond Banning the sun shines hotter. The air becomes dry and almost burns our faces. We leave the homes and cultivated slopes behind. Rocks and sand and bushes take their place. Ahead is a vast desert valley stretching as far as the eye can see.



Picking cantaloupes in Imperial Valley. Why do you suppose Mexicans are hired to do the work instead of white people? Find out what kind of summer weather Mexicans are used to in their homeland.



Imperial Valley grows many kinds of vegetables. What do you suppose is under these little paper cups? Under each is a hill of cantaloupe plants. The paper is put over them to protect them from the cold nights and from the winds. Note how much farther apart the rows are than rows of lettuce. This is because cantaloupes need much more room. When the vines are grown they will cover all the ground.

Do you know why this land is so dry? There are mountains between it and the ocean. We have just come through a gate in these mountains. Think of how the cool tops of these mountains steal the water particles from the clouds. The most of the particles fall on the side toward the ocean.

When the clouds are very thick and heavy a little

of the water they hold escapes the mountains. It falls on the dry slopes. Nature has put here plants that can live and grow with very little water. They are quite unlike those with which we are familiar. All living things in the desert are interesting.

We must not think of a desert as always covered with sand and rocks. Imperial Valley is a part of the Colorado Desert. It has the richest soil in the world. Water was the only thing it lacked when people came.

We must not think of the desert as a place that is hot. Our deserts are very hot in summer. But in winter the air is delightful. In the Far North are deserts that are always cold. At the foot of the mountains we have just passed are many little valleys. They are arms of the great desert. Canyons come down from the mountains to these valleys. There is more water here than in the open desert. Once in a while you will find a spring.

Nature has planted the most wonderful flower gardens in some of these little valleys. There are many kinds of cactuses and other shrubs with beautiful flowers. How interesting their names are: strawberry cactus, fish-hook cactus, hedgehog cactus, barrel cactus, pin cushion cactus, and beavertail cactus. Among the shrubs and trees are the century plant, smoke tree, indigo bush, desert holly, candlewood, ocotillo, and the palo verde tree.

About every spring you will find fan palms. This is the home of the fan palms that you see planted

along the streets. Thoughtless travelers have burned many of these palms. Now they are protected by law as are other desert plants.

A spring rain in the desert works like magic. All unknown to us millions of little seeds lie sleeping



How would you like to pick up this pincushion cactus that grows in the desert? It looks much like a sea urchin except that it is green while the sea urchin is purple. Would it be easy for an animal in search of something to eat and drink to get at the soft pulp inside?

in the sand. At the touch of water and spring sunshine they awake. In a few weeks the barren slopes are covered with the most wondrous flower garden you ever saw.

In many places you cannot walk without stepping on flowers. They are of many kinds and colors. The whole desert, as far as you can see, is bright with flowers. You think you would like to stay here always. The sand verbena and the evening primrose are the most fragrant.

But all too soon a change comes. A dry hot wind comes up. The petals of the flowers wither and fade. The ripe seeds fall to the sand. The plants die and their stems are blown away. The hot summer sun soon shines overhead. The flower garden has vanished. It will come again next spring if there is rain. If there is no rain the seeds will lie buried in the sand. They can wait until it does rain.

But we must leave these beautiful spots where Nature spreads her desert flower garden. We must follow the paved highway farther into the desert.

The sun is hot and everything seems dead. Do you wonder that the people who had to cross this land with horses or ox teams were afraid of it? How different it is now. We have a smooth road, a swift automobile, and plenty of water.

Soon we meet trucks loaded with fruits and vegetables. What does this mean? Where do they come from? These things cannot grow without water. Springs are small and far apart.

By and by we come to houses and cultivated fields. We pass miles of orchards, vineyards, melon fields, cotton fields, alfalfa fields, and sleek cattle. We pass through towns and small cities. Most wonderful of all are the date palms. They make us think of the land of the Arab children.

Water is the magic that has changed the barren desert into fruitful fields. We see the wells. From some of them the water flows without any help. We hear the engines pumping it from others. Far down in the earth Nature has stored this water.



The picture shows a curious sort of a stream, for it has no banks and seems to flow anywhere it wants to. This is the Whitewater River. It rises on San Geronio, our highest mountain, and empties into that part of the Colorado Desert called the Coachella Valley. This water will soon sink in the desert sand, but it is not lost. Lower down in the valley deep wells reach this water flowing through the sand and pump it up to supply the date palms, grapefruit orchards, and gardens.

Going farther we come to large irrigation canals. Where does the muddy water come from? We follow the ditches and finally reach a great canal. The canal leads us to a broad muddy river. This is the Colorado that you have all heard about.

The Colorado River starts in high mountains far away toward the east. The water has come hundreds of miles. A part of the way it flows through a deep canyon. At last on its way to the ocean, it reaches the desert. Men built a dam and dug canals. They turned the water onto the desert. The sun is hot. The soil is fertile. You can almost see things grow with the coming of the water.

Can you tell what foods we get from Coachella and Imperial valleys? There are some that come in the spring; others come in the summer; still others in the fall. Winter also has its fruits and vegetables.

Imperial and Coachella valleys are only a part of our "Land of Little Rain." The other part we call the Mohave Desert. There are three mountain gateways by which we can reach this dry land.

We will go first to San Bernardino. There we will turn north and climb a long slope. This leads up to the rim of mountains of which we have already heard. At the top of the slope there is a gate in the mountains we call Cajon Pass.

From the gate we look out on a dry land unlike that we have just visited. That was a low desert. This is a high desert. We come to apple orchards instead of date palms. What does this tell us about

the winter climate? There is also a desert plant that we have not found before. It grows as large as a tree, but it is unlike any tree we have ever seen. We call this the Joshua tree or tree yucca. It grows far over the slope, almost like a mountain forest.

Suppose now we try the gates north of Los Angeles. Smooth highways take us through mountains to the same Mohave Desert. One highway follows the railroad. We first pass through two mountain gates. Then we go down through Antelope Valley to the desert.

Antelope Valley is on the edge of the desert.



This is the way the desert looked before people brought water into it and made their homes there. The only roads were natural roads. The plants that you see are Mexican creosote bushes. They will grow where there is very little rain. Their leaves are very small and their stems are covered with an oily substance so that they will not lose their precious moisture through evaporation in the burning summer air.

People have made homes here because they can get water. We have learned how a little of the rain gets past the mountains. There are apple and pear orchards and alfalfa fields. There are no orange trees. What does this tell us about the climate?

Now we cross the open desert and come to the last gate. This is Tehachapi. There is a pretty valley in the center of the gate. Here there are miles of orchards. You have all eaten the delicious pears from Tehachapi Valley.

Beyond Tehachapi we have to go down a long winding road to the San Joaquin Valley.

SUGGESTIONS TO THE TEACHER

Model roughly the water parting between the desert and the coast slope. Show the children how this is like the two sides of a house roof.

Make gateways in the mountains, one leading to Imperial, the others to the Mohave Desert.

Review with the aid of the model the reasons for the lack of rain east and north of the mountains.

Model the Coachella and Imperial valleys with the mountains on the west, and mountains and the Colorado River on the east.

Show that these valleys make a basin without outlet, and that the Colorado River once flowed into it.

Model the Mohave Desert, making it higher than the Colorado Desert. Make it wide toward the Colorado River on the east and narrow toward the west where the Sierras and the water parting already modeled come together.

Show the different gates into the Mohave Desert from Los Angeles and the two gates opening to the San Joaquin Valley.

THINGS TO DO AND TALK ABOUT

In what way do we make openings through mountains where Nature placed none?

If you were in the desert and got out of water, where would be your best chance of finding a spring?

There are mountains in our deserts. Why does it rain more on these mountains than in the lowland around them?

Which of the following plants tell you where there is water: cactuses, palms, sagebrush, or willows?

Can you tell some of the ways in which Nature fits the desert plants to live through the long dry summers?

Many of the desert plants have a long tap or middle root which they send far down into the sand. The orange tree sends out roots close to the top of the ground. Why is this difference?

The desert is a very healthful place in which to live. Can you think of any reason for this?

A few Indians live in the desert. Where do you suppose they get their water, and what do they find to eat?

Find out any thing you can about the mesquite tree that grows in the desert. Is this tree useful to the Indians?

The desert Indians are unlike the Indians that once lived around Los Angeles. They make pottery dishes. They cultivate the ground and grow beans, squashes, and corn.

Tell about any desert animals you have seen. Some one might describe the horned toad.

Why do you think the cactus plants are so thorny?

Why does the water rush down the slopes of desert mountains faster than down the slopes of mountains near the ocean where it rains more?

NEW OR UNUSUAL WORDS

familiar	protect	unknown	pave
	vanish	describe	

CHAPTER XXVIII

WHY EVERYBODY LIKES OUR LAND

OUR LAND is surrounded by the ocean, mountains, and deserts. Within our land are high mountains, canyons, valleys, and plains. There are many kinds of slopes. Each slope has its own climate, soil, and products. There are many people scattered over these slopes and others gathered in towns and cities.

Our land is much like the great world made small. It is a picture of the great world. This land of ours once seemed far away from the rest of the world. It was really almost as far from where other people lived as was Robinson Crusoe's Island. But it has gateways on every side. Some open to the ocean, others open to the land, and another to the air. There are now highways through these gates to all the world. There are harbors and wharves, depots and airports.

People everywhere have heard of Southern California and its chief city. The word California has a magical sound. People who have never seen it have pictures of it in their minds. They think it is a land to which Nature has given every good thing that she has. You have learned from this book much about this wonderful land. Have you learned anything that you think Nature could have made better?

People everywhere want to come to our magical

land. But they should know that it is not a lazy man's land. Everyone has to work here just as everyone does in other places. But here Nature rewards those who work and are ambitious more than she does the people of any other land.

The first people who saw our land were sailors. They went home and told others that it was a land where it is always summer. The many visitors who



Cotton picking in Imperial Valley. The pickers are dark-skinned people. Do you think they are Mexicans or Negroes? Give reasons for your answer. Is the cotton ready to pick or not? What time of the year is cotton picked?

come now think the same thing. They enjoy our mild winters. They think our summers are also pleasant.

Many of our visitors want to stay and make their homes here. They can find here almost any kind of climate they wish. It makes no difference what part of the world they come from. We can offer them any kind of work which they are used to doing in their old homes.

Suppose one of our visitors who has been a fisherman wants to make his home in our land. Where would you tell him was the best place to engage in fishing? Give your reasons.

A second visitor wants to grow alfalfa. Can you tell him where to look for a good ranch? Think first of the kind of land best suited to alfalfa. Then think of any slopes where you have seen it growing, or where it ought to grow best.

The third, fourth, and fifth visitors are interested in cattle and sheep. One of them wants to have a dairy herd and sell milk and cream. Can you help him? Had he better select a place near some large city?

Another is used to raising range cattle for beef. Had he better select valley land or mountain land? Which would cost him less money? Give reasons for your answer. Still another wants to keep sheep. Our land was once the home of many sheep. Will it be easy for him to find a place now? Would you use land that is good for alfalfa, fruit, or vegetables for pasturing sheep?

A sixth visitor is interested in cherries, pears, and apples. He wants to grow the best. Surely you can tell him where to look for suitable land.

A seventh visitor wants to make his home where he can grow beans and sugar beets, and perhaps have a crop of summer lettuce. Can you direct him?

An eighth would like to grow figs. What can you tell him about this fruit?

A ninth would like an orange or lemon grove. Would he have to choose the same place for both these fruits? What can you tell him about the sort of place avocado trees like?



This is a ranch home in the mountains. Note that the walls of the cabins are made of hewn logs. The roofs are covered with split shingles or shakes. What kind of trees do you see? What do you think the people might do for a living? Might they keep cattle or grow apples?

The tenth man is used to growing celery, artichokes, and asparagus. Can you tell him where these vegetables do best?

An eleventh visitor says he wants to live where it is very hot in summer. He wants to know if we have such a place. What could he do for a living in our hottest valley? Could he grow anything without irrigation?

The twelfth and thirteenth visitors are interested in growing muscat grapes. One wants to grow grapes for the table. The other wants to make raisins. Could they get places near each other and so be neighbors? Or would the raisin man have to go somewhere else?

A fourteenth visitor is a farmer from a state where the chief business is growing wheat. Wheat will grow without irrigation in most of our valleys. Do you think it will pay him to grow wheat? In the land he came from wheat is the best crop. Is it the best crop in our land? Would it make a difference if there were no highways by which we can get wheat and flour cheaply?

A fifteenth visitor is a coal miner. Will he find anything to do here?

A sixteenth visitor is a gold prospector and miner. Can you tell him where he might hope to find veins of quartz with specks of gold in it?

There are a number of visitors used to city life. They want to make their homes in one of our cities. Mention occupations you think are open to them.

Why do visitors who are used to making things and working in factories like our land? Talk about the following:

1. Our land has good transportation. Explain this fact.

2. Our land has cheap fuel—both gas and petroleum.

3. Our markets are filled with many kinds of foods.

4. Our land has a healthful climate. One can live out of doors much of the time.

We have many shops and factories in which different kinds of work are carried on. Let us think of what is being done in Los Angeles and the country around it. Tell what you know about the following kinds of work:

1. Why large cotton factories might be built here. Is this a good place?

2. Why we might produce silk and have factories for weaving it.

3. What do you think about woolen factories? Do we produce much wool?

4. Why Los Angeles is a good place for rubber and tire factories.

5. Why there are many fish and fruit canneries here.

6. Other kinds of work done in shops or factories. Tell about any of which you know something.

Our land is like many lands all made into one. We have to thank the mountains for this. If our land were one great plain there would be few occupations for our visitors to choose from. Many of them would make their homes somewhere else.

NEW OR UNUSUAL WORDS

abundance	stretch	mild	difference	interest
	neighbor	business	prospector	

CHAPTER XXIX

THE GREAT LOS ANGELES MARKET

WE HAVE BEEN LEARNING about our California home. We have seen much of it on our automobile rides. We have camped in the mountains. We have spent days on the seashore.

We have learned something of how Nature got this home ready for us. We have learned of the rules she has made for taking care of it.

In our storybooks we have visited other lands. We have discovered how the people live, what they do, what they eat, and how they clothe themselves.

Is there any one of these lands that has such comfortable homes? Is there one that has so many kinds of climate? Is there one that has so many vegetable gardens as our own? Is there one that grows so many kinds of fruit? Is there one that grows so many nuts?

Have you heard of any land that has so many good roads? Have you heard of a land where you can see so much in one day's ride as in ours? A ride of three hours will take you from the cool ocean, through warm sunny valleys, to cold mountain tops. From the mountain tops you can go down to deserts burning hot in summer.

Nature intended us to get our food from the vegetable kingdom. She gave us chewing and grinding

teeth for this purpose. She gave tearing teeth to those animals she intended to eat meat. We are learning that her rules are very good ones to follow.

We eat more fruits, vegetables, and nuts than any other people in the world. We grow nearly all of these ourselves. They come to our table fresh from nearby orchards and gardens. Do you not think we ought to grow stronger than other people? Do you not think we ought to live longer? Do you not think we ought to have brighter and keener minds?

We should try to get other people to do as we do. Our food will make them as strong and healthy as it does us. It will also help us. It will give us work to do and make a market for all that we can grow in our warm fertile valleys.

We have found out much about the many slopes of our land. Each slope has its own climate and soil. One kind of slope grows oranges better than anything else. Another kind grows beans better than it does anything else. There is no one slope that will grow all kinds of things equally well.

Orange trees cannot stand the cold of a high mountain valley. The summer sun will kill lettuce in Imperial Valley. But the cool summer air of the coast is just what it wants.

We cannot grow cherries or the best apples near Los Angeles. But in mountain valleys the trees are at home and their fruit is delicious. If it were not for the hot summer sun in Imperial Valley we could not grow the wonderful dates that you have all eaten.

How is it that wherever we live we can have any kind of food we want? We can get all the products of our own land. We can get many of the products of far-away lands.

There are two means by which we can get the foods we want. One of these is good transportation. By this is meant a cheap and easy way for foods to be brought to us. Our land is covered with a network of automobile roads and railroads. A gardener or orchardist can ship his products everywhere to everyone who wants them.



There are very pretty valleys in the mountains north and east of San Diego. The gentle slopes are dotted with oak trees while curious granite rocks, with the elfin forest growing among them, dot the steep slopes. Many kinds of delicious fruits are grown in these valleys. In the high valleys there are apples and cherries. In the low valleys there are grapes, oranges, and avocados.

Fast steamers with refrigerators bring us fruits of the hot lands far to the south. Can you name some of these fruits? We could get along without these very well, for we have so many of our own. But they are quite unlike any that we can raise. They add to the pleasure of our lives.

The other means by which we can get the things we want to eat is the great Los Angeles market. In this market we find products of almost the whole world. From this central market or exchange foods are sent out again. Each kind goes to the place where it is wanted.

There are really two great markets in Los Angeles. But we will look only at the one nearest the heart of the city. What a variety of things you will see in this market! They have been brought here from every nook of our land as well as from other lands.

The dealers from all parts of the city, from the whole country around, and from other cities come to the great market. They buy what vegetables, fruits, and other products they want for the coming day. Then they take their loaded trucks back to their own little markets or fruit stands.

There are thousands of vegetable gardens, orchards, and vineyards that supply the Los Angeles market. Some are in the Los Angeles Valley. Some are near San Diego. Some are in Imperial and Coachella valleys. Some are in the San Fernando Valley. Some are in the Valley of the Santa Clara

River. Some are in the San Joaquin Valley. Some are in valleys still farther away. The products from these far-away valleys are brought by railroad train.

There are hundreds of large trucks that bring fruit from the San Joaquin Valley. They have to travel two hundred miles or more. They have to climb over three mountain ranges. But the roads are so hard and smooth the fruit is not injured.

The trucks are loaded and made ready the day before. The drivers start so as to reach Los Angeles after midnight. From the time they get there until after daylight the market is a busy, noisy place.

The market covers a whole city block. Hundreds of small markets and stalls face the open square in



This is the great Terminal Market in Los Angeles. Here your fruit dealer comes or sends every morning for what he expects to sell throughout the day.

the center of the market. Roadways are kept open for trucks coming and going. The rest of the open space is filled with trucks drawn up in lines. The owner of each truck stands by his load. He will sell to the first buyer if he will pay the price asked.

The market is a wonderful sight in the middle of the fruit season. There are piles of melons. There are stacks of every kind of fruit and vegetable that grows in our land.

Here you will see the peddlers of fruit and the owners of fruit stands buying what they need for the coming day. As daylight comes their trucks are loaded and start for home. Some of them have a long way to go, for they come from almost every town and city in Southern California.

It is still early when the fruit dealer reaches his home. The load is quickly arranged on his stand. The fruit looks as though it had just been picked; the vegetables as though just taken from the ground.

By eight o'clock you can go to the market in your own town, city, or crossroads and buy any fresh produce you wish. Some of the things you get may have come one hundred or two hundred miles; some from much farther, even from across the ocean.

It is because of the good roads and the great central market in Los Angeles that you can have anything you wish delivered at your own home.

NEW OR UNUSUAL WORDS

interest equally transportation exchange

CHAPTER XXX

IN WHAT PART OF SOUTHERN CALIFORNIA WOULD YOU PREFER TO LIVE?

WHEN YOUR FATHERS and mothers were children, cities were not as large as they are now. Then a home in a town or city was more pleasant than a home in the country.

Country roads were poor and rough. Sometimes the mud was very deep. People traveled about with horses and wagons. It took a long time to make a journey of a few miles. There was no mail delivery in the country. There were no electric lights. Farmers often went to town only once a week.

Now all this is changed. Country people have all the good things that city people have. They have some things that city people must go without. Will you tell what some of these things are?

Now country roads are hard and smooth. The country schools are as good as the city schools. The farmer has electric lights in his home. He has a telephone. The postman goes by every day. He can go to church, to a theater, or to a concert in a few moments in his automobile. He has a radio in his home. With the radio he can hear the best concert or sermon without leaving the house.

Let us picture again in our minds what we saw from our balloon high above the City of Los Angeles. Much of the country seems to be covered by

one great city. We cannot tell where Los Angeles ends and Glendale, Pasadena, Santa Monica, or Long Beach begins. These places are not a part of Los Angeles, but Hollywood, Venice, and San Pedro belong to it. Besides all these cities there are many others not far away.

Every year more people come to our land. Every



Can you imagine a prettier entrance to the city of Pasadena than the road in this picture? This is one of the roads from Glendale and Eagle Rock to Pasadena. It shows how we cut into the hills and build bridges so that we can ride comfortably over rough country.

year the cities are taking in more of the country. By and by it will look like one great city. It will look like one great city from San Diego to San Bernardino and from San Bernardino to Santa Barbara. The only places where we shall see no buildings are the mountain slopes that are too steep for homes.

Where shall we then go if we want to live in the country? We shall have to go to Imperial Valley, to Antelope Valley, to the San Joaquin Valley or to a mountain valley? Tell something you know about each of these valleys. In which would you rather live?

Can you think of a city filling all the coast valleys of our land? Different parts of this city will have different names. It will be a city of all sorts of slopes. It will have seacoast, valleys and mountains. It will have all sorts of climate. The people of each part will have their own work to do. In what part of this great city would you rather live?

THE LOS ANGELES BOY

"I like to live in Los Angeles because there is so much to see. There are miles of stores with their pretty windows. In these windows there are beautiful things from all parts of the world.

"Our home lot is small. But it has a bit of green grass in front. Behind the house there is room for a little garden. There are markets near by where we can buy milk and all kinds of fruits and vegetables.

These are as good as we could get if we lived in the country.

“There are many beautiful parks with grass, flowers, and trees. In some of the parks there are little lakes with boats on them. In the parks are playgrounds with everything we want. We can enjoy ourselves in as many ways as can the country boy.

“There are museums where we can see curious things from other countries. There are concerts where we can hear beautiful music. There are many moving picture theaters where we are tempted to spend our money.

“There are great markets where all kinds of produce are sold. What fun it is to wander through these markets! All is bustle and noise. Each dealer tries to make his stand the most pleasing to the buyers. People go away carrying huge paper bags filled with every kind of food you can think of.

“I like Los Angeles because it is neither too cold nor too warm. I like it because it is in the center of our little world of Southern California. We can go either by steam cars, electric cars, or by automobile to every part of this little world.

“We can go south to Long Beach and San Pedro. We can go southeast to Santa Ana and San Diego. We can go west to Venice and Santa Monica. We can go southwest to Redondo. We can go northwest to Ventura and Santa Barbara. We can go north to Glendale, Burbank, San Fernando, and the San Joaquin Valley. We can go northeast to Pasadena.

We can go east to Pomona, Riverside, Redlands, San Bernardino, and Imperial Valley. I think Los Angeles is the best city in the world."

THE SAN DIEGO BOY

" I like San Diego because it has a fine bay. No other city of our homeland has such a fine bay for boating. The mouth of the bay is so narrow the ocean waves cannot enter.



Near the summit of the mountains back of San Diego is a little town known as Julian. There are gold mines near by that helped make the town. There are also fertile slopes, as you can see, on which are grown the delicious apples for which San Diego County is noted. There are also cattle ranches around Julian. Why are beef cattle raised here and not around San Diego city? Can you see the pine trees? These tell you that the place is nearly a mile above the ocean.

“I like the long smooth beach at Coronado. On one side of Coronado the ocean waves are always breaking. On the other side the water of the bay is warm and quiet. I like the great cliffs of Point Loma. In these cliffs are deep, dark caves. Some of them you can enter only at low tide.

“I like San Diego because of Balboa Park with its many kinds of plants. I like to go to the museum and to the concerts. Point Loma stops the cold sea fog. This gives our city a very pleasant climate. The sunshine is never too warm.



A country home near San Diego. This shows how, with the help of water and hard work, beautiful homes can be made on slopes that Nature left rocky and dry.



A lily pond and Natural History Building in Balboa Park, San Diego. Can you imagine a picture more beautiful than this? There has been magic here as well as in Los Angeles. Only a few years ago Balboa Park was a dry mesa where only the bushes of the elfin forest grew.

“If you want to find very warm valleys you must go back over the hills. The ocean breeze does not reach these valleys. This is the reason the oranges are so sweet and the raisins so good.

“The land slowly rises back of our city. At first it is flat and we call it the mesa. Next come hills with warm valleys between them. The hills finally turn to mountains.

“If you will go to the top of these mountains you can look down into Imperial Valley. The mountains are so steep it was much work to build roads across them. But we could not get along without the moun-

tains. They supply our city with water. On their tops are pine forests where we love to camp in summer. The mountains have mines of gold and other minerals. Among the mountains are pretty valleys where we go for red-cheeked apples."

THE SANTA BARBARA BOY

"I think Santa Barbara is a very pleasant place. The Indians also thought it very pleasant, for there were once many here. In our city is the best mission church of all our land.

"Santa Barbara is on low hills close by the ocean. North of the city are high mountains. These break the cold north winds. Out in the ocean are the Santa Barbara or Channel Islands. These break the ocean winds and waves. The mountains on one side and the ocean and islands on the other make the climate of our city mild and pleasant.

"There is a fine beach where we go swimming. There are no great wharves or noisy steamers. There are no factories. Because of these things Santa Barbara is a good home city. It is also a pleasant place for tourists. Very many visitors come here both winter and summer."

THE BOYS OF REDLANDS, RIVERSIDE, AND SAN BERNARDINO

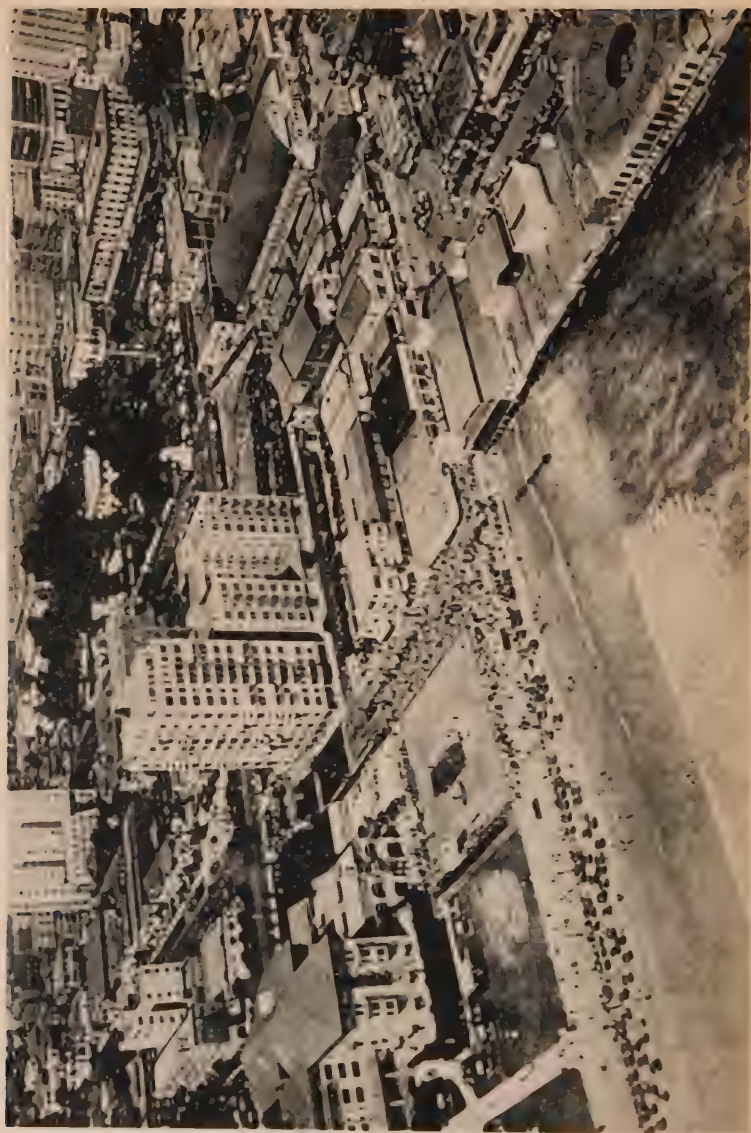
"We think the San Bernardino-Riverside Valley the best valley in Southern California. We love the great mountains that look down upon us. They send us the water that makes the orange orchards so

fruitful. We enjoy the warm summer days. But if it gets too warm we go to the mountains. They are our summer playground.

“The people who come from the East must pass through our valley on their way to Los Angeles. We have two gates by which we admit people. Do you remember what they are called? One gate is on the north. It opens from the Mohave Desert. The other is on the east. It opens from the Colorado Desert. Ours is the first fertile valley that people see after crossing ‘The Land of Little Rain.’



The beach at Venice. Is it summer or winter? Do you think it is a warm sunny day or a foggy day? Why would you think that it is a holiday and not a work day?



This is a picture of the heart of Long Beach as a bird might see it. At the right you can see a little of the pleasure pier.

"People know our oranges all over the world. Riverside is where the first navel oranges were grown. The hot summer sun makes them very sweet.

"We do other things besides grow fruit. Have you seen the great hill at Colton called Slover Mountain? It looks as though some giant within the earth were tearing it into pieces. From it men get rock for making lime and cement. We use a great deal of these materials in making buildings, streets, and water pipe."

THE BOYS OF THE BEACH CITIES

"You know why we like to live by the ocean. We do not need to tell you. If you could go along the shore from San Diego to Santa Barbara you would find long stretches of smooth sandy beach. Between these you would have to cross rocky points or headlands. You would pass through more towns and cities than you could count on the fingers of your two hands.

"I like Long Beach because of its ocean bathing and street of wonderful little shops and amusements. Our city has oil wells and a harbor where we build ships and make goods of many kinds."

"I live at San Pedro," says another of the boys. "Perhaps you think San Pedro is a city all by itself, but it is not, for we belong to Los Angeles. This is a pretty safe place in which to live because on the hills above us are forts with great guns.

"Ships are coming and going all the time. They

are carrying away petroleum, cotton, and fruit of many kinds. They come back loaded with lumber, iron, silk, bananas, and pineapples."

"I think Santa Monica is the best of all," says a third boy. "We have a fine beach with a pretty bluff behind it. North of our city there are mountains. Winding roads lead over these mountains to San Fernando Valley. You have to go through our city if you want to take the new highway to Ventura and Santa Barbara. This highway lies between the beach and the Santa Monica Mountains. It is the most interesting coast highway in all our land."

SUGGESTIONS TO THE TEACHER

Most of the children know something of other parts of Southern California besides that part in which they live. There are many topics not taken up in this chapter which can be handled in the same way by the children familiar with them.

Let the children discuss topics such as the following, letting them in each case take up any other words which they are familiar:

1. A home by the ocean.
2. A home in a valley a few miles from the coast.
3. A home in a valley at the foot of the mountains.
4. A home in one of the desert valleys.
5. A home in a mountain valley.
6. A home in a canyon.

NEW OR UNUSUAL WORDS

admit fence supply announcements mess

CHAPTER XXXI

SOUTHERN CALIFORNIA IN THE LONG AGO

WE HAVE LEARNED that Nature has made the ocean and the land change places. The ocean once covered all the lowland around Los Angeles. At another time the ocean went back. It left dry land as far out as Santa Catalina and the Channel Islands.

The ocean is the mother of the clouds. The clouds carried by the winds bring the rain. The rain makes the streams. The same wind that brings the clouds over the land makes the waves of the ocean.

The streams have spread a part of the soil that fills our valleys. Another part they carried to the ocean. Then the waves and currents spread it over the bottom. A part of this bottom is now dry land. In this way the waves and the streams worked hand in hand to make the soil of our valleys.

Nature is working now just as she always has done. But it takes her a long time to change things very much. The mountains, valleys, and ocean are where they were when the first white people came. But the living things have changed. This change in living things is mostly because of what we have done. We have killed all of certain kinds of animals and birds. There are only a few left of other kinds. We have brought many new plants and animals from other lands.

The pioneer settlers tell wonderful stories about the birds and animals that were here when they first came. The sky at times would be almost covered with the flocks of geese and ducks. There were great numbers of deer, antelope, bear, and elk. The antelope are all gone. The elk are all gone. Once in a while a bear is to be seen in the wildest parts of our mountains. There are now laws protecting the deer or they would all be gone.

Did you ever think what white people have done to the animals, birds, and plants? We think some of the animals are very bad because they kill other animals. But Nature made them to do this. We have been worse than any of the animals because we were not intended to do as they do.

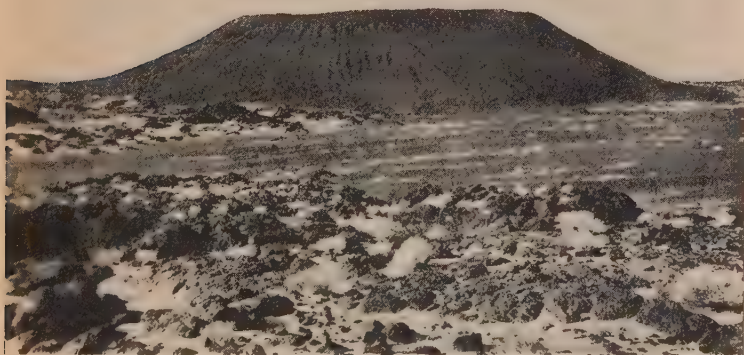
We have gathered wild flowers without stopping to think that we should leave plenty of them to make seed for another year. We have broken down the Christmas berry bushes. We have carried away the stems of the beautiful yucca flowers. For the sake of money men have begun to destroy the wonderful desert plants. Now many of our wild plants are protected by law.

The thoughtless hunter will have his quail. He does not care if it is the last one on the earth. Most hunters go out to kill for pleasure. That is worse than any animal does. The animals hunt only because they are hungry.

Nature slowly changes the plants and animals. But she does it according to her laws. We do it with-

out thinking that we are breaking Nature's laws. Some of us would do it just the same if we did know that we were breaking her laws. We shall surely be punished for breaking Nature's laws just as we are for breaking our own laws.

Now let us think of a time long, long ago before people came to our Southern land. The birds and animals of that time were quite unlike those which the Spanish padres found here. You will ask how we know that this is true. I will tell you, or rather, I will ask you to go with me to a place where you can see



You have all heard of volcanoes—those mountains that spout fire and melted rock. But did you know we once had some in Southern California? Far away from where people live, in the middle of the Mohave Desert, there is the volcano shown in the picture. If you climbed to the top of it you could look down into a hollow that we call the crater. This once opened down into the earth. Our volcano is now extinct or dead. Why are you sure it is in a desert?



This is an imaginary drawing of the La Brea Springs and of the animals that came to them long ago. At the right is a great bear caught in the tar. In the middle are two submerged figures creeping up for a feast on the bear when he gets down deep in the tar and is helpless. Sitting on the tree are vultures waiting for their feast. In the background you can see the elephants that once lived here.

with your own eyes bones of the creatures that once made our land their home. From the bones men can tell just what these creatures were and how they looked.

We are going to visit La Brea tar or petroleum springs. You remember that the early settlers of Los Angeles went to these springs to get tar with which to cover the roofs of their houses.

Brea is the Spanish word for tar. It is what is left of crude petroleum when it is dried out. It is black and soft like thick molasses. But when the air is very warm it is almost as thin as water. When the air is cold it becomes hard. Then it is brittle and will break like molasses candy. We sometimes call this tar *asphalt*. Many of our roads are covered with asphalt mixed with sand.

There are springs of tar just as there are springs of water. The tar comes up through cracks in the rocks from deep within the earth. When you are older you will want to know the story of tar and how Nature made the oil from which it comes. You will want to know how it came to be placed a mile or more down in the solid rocks of the earth.

If we go toward Venice from the center of Los Angeles we soon come to La Brea Springs. Here there are little hollows in the ground holding tar and water. In some places there is no water and the tar is hard and dry. Here and there holes have been dug. Let us go into some of the holes or pits.

Upon the sides of the pits we can see of what the



This is another imaginary view of the La Brea Springs with the animals that came to them. At the left are two bears caught in the tar. In the middle are wolves waiting until the bears are helpless. At the right is a saber-toothed tiger. Farther away there are camels and back of them running horses.

earth is made. There are pieces of hard, light-colored rock mixed with earth and sand. Streaks of hard tar or asphalt appear in places in the sides of the pits.

But what do you suppose is the most interesting sight? Sticking out of the tar are pieces of bone. Once in a while you will see a whole one. If you hunt long enough you may find a skull. Some of the bones are very large. Some are quite small. There seem to be bones that belong to different kinds of birds and animals. The bones that lie wholly in the tar are the most perfect.

Many thousands of bones have been taken from these pits. They have been studied and arranged. Men have fitted these bones together and have built up again the skeletons of birds and animals, just as they were when they were alive.

These birds and animals were all different from those now living. Go to the museum in Exposition Park and you will find many of these skeletons. You will find the name on each and words telling about it.

Among the animals whose bones we have there are tigers. The most dangerous of all was the saber-toothed tiger. There were lions larger than any now living. There were fierce little animals like wolves, and huge bears. All of these were flesh-eating.

There were also elephants, camels, wild horses, sloths, and tapirs. These were plant-eating animals. In addition there were birds almost without number. Birds and little animals are caught in tar springs now just as they were in the long ago.

All these creatures once lived in the land that we now call Southern California.

How did so many animals get caught in the tar? Let us picture in our minds how it must have happened.

The water bubbled up with the tar in many pools. Often there was enough water to cover the tar and hide it. Animals wandering by stopped to drink and got their feet in the tar. It made no difference whether the animal was little or whether it was large and strong, if it once got into the sticky tar it never got out.

Suppose an elephant or giant ground sloth came to one of the pools. It stopped to drink or slipped in by accident. Soon it was fast. Then a lion or one of the terrible saber-toothed tigers came along. It saw the great animal helpless in the tar and jumped on it for a feast. It also fell into the tar. Wolves came by. Perhaps they smelled the other animals. This was their chance, now that their great enemies were helpless. Many of them fell into the tar while quarreling over the bodies.

A deer, antelope, horse, or camel stopped to drink and was caught. Little animals were caught in the same way. Eagles and vultures flew down for a meal and got into the tar. Thinking the water harmless, other birds were caught. And so the story went on for many, many thousands of years.

You know that bones buried in the soil soon decay and crumble to dust. But the bones of the creatures

that got into the tar were preserved or kept just as they were. Water could not get at them to soften them.

After thousands of years people came to Southern California. They discovered the bones and started digging in the hard asphalt for more. They put these bones together as they once were. How interesting these skeletons are. They tell us what animals and birds once lived here.



One of the La Brea pits where men have been digging out bones of the animals that were caught in the soft tar long ago. Now the tar is dry and can be dug with a pick. The man in the bottom of the pit is telling the others about the saber-toothed tiger. He has the skull of one in his hands.

Since the tiger, the elephant, the horse, and the camel lived here Nature has given our land a different climate. She has given it new animals, birds, and plants to fit the new climate. We should be careful about killing them. We should let Nature do that in her own way. Ours would be a dreary world without the wild animals, birds, and flowers.

NEW OR UNUSUAL WORDS

preserve	gather	protect	punish	stick	out
	accident	helpless			

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